MISSOURI

state rail plan

DRAFT

State Rail Plan

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Prepared for:

Missouri Department of Transportation

Prepared by:

HNTB Corporation

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List of Abbreviations

AA/DEIS	Alternatives Analysis/Draft Environmental Impact Statement
AAR	Association of American Railroads
AM	Arkansas & Missouri Railroad
Amtrak	National Passenger Railroad Corporation
ARRA	American Recovery and Reinvestment Act of 2009
BNSF	Burlington Northern Santa Fe Railway
BTU	British Thermal Unit
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMR	Central Midland Railway
CN	Canadian National Railway
CNT	Center for Neighborhood Technology
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COLT	Columbia Terminal Railroad
CP/SOO	Canadian Pacific Railway/Soo Line Railroad
CRG	Continental Rail Gateway
CSX	CSX Corporation
CTF	Missouri Comprehensive Transportation Fund
EPA	United States Environmental Protection Agency
FAF3	Federal Highway Administration 2010 Freight Analysis Framework
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GARVEE	Grant Anticipation Revenue Vehicle Bonds
GCSA	Missouri Grade Crossing Safety Account
HSIPR	FRA High-Speed and Intercity Passenger Rail program
IMPLAN	Impact Analysis for Planning Group
IRS	Internal Revenue Service
KAW	Kaw River Railroad
KCS	Kansas City Southern Railway
KCT	Kansas City Terminal Railway Company
MHTC	Missouri Highways and Transportation Commission
MNA	Missouri & Northern Arkansas Railroad
MNC	Missouri North Central Railroad
MOC	Missouri Central Railroad Company
MoDOT	Missouri Department of Transportation
MORPAC	Missouri Rail Passenger Advisory Committee

MRS	Manufacturers Railway Company
MTFC	Missouri Transportation Finance Corporation
MWRRI	Midwest Regional Rail Initiative
MVP	Missouri and Valley Park Railroad Corporation
NEPA	National Environmental Policy Act
NOFA	Notice of Funding Availability
NORTAD	North America Transportation Atlas Data Base
NO_x	Nitrogen Oxides
NS	Norfolk Southern Corporation
O-D	Origin-Destination Pairs
OVRR	Ozark Valley Railroad
P3	Public-Private Partnership
PAB	Private Activity Bonds
PIIF	Private Infrastructure Investment Financing
PNRP	Preliminary National Rail Plan
PRIIA	Passenger Rail Investment and Improvement Act of 2008 (PL 110-432)
RRIF	Railroad Rehabilitation and Improvement Financing
S&T	Switching and Terminal Railroads
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy For Users (PL 109-59, 2005)
SE	Semo Port Railroad
SKOL	South Kansas and Oklahoma Railroad
SO_x	Sulfur Oxides
STAR	State Transportation Assistance Revolving Fund
STB	Surface Transportation Board
STP	Surface Transportation Program
TAM	Transportation Asset Management
TC	Transportation Corporation
TDD	Transportation Development District
TE	Transportation Enhancement Funds
TIFA	Tax Increment Financing Authorities
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery Grant Program
TOD	Transit Oriented Development
TRRA	Terminal Railroad Association of St. Louis
UP	Union Pacific Railroad Company
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VOCs	Volatile Organic Compounds

1.0 Introduction and Vision

The Missouri Department of Transportation (MoDOT) has prepared this state rail plan to guide the development of the rail system and rail services in Missouri over the next 20 years. This state rail plan identifies current and future needs of the system and considers and defines public policies which will encourage and enable ongoing investments to the system to support future needs. This document meets the state rail planning requirements included in the federal Passenger Rail Investment and Improvement Act of 2008 (Public Law 110-432) (PRIIA) and will help assure Missouri is positioned to obtain federal funding for rail projects.

The plan is based on the understanding that the maintenance and expansion of rail service is critical to the economic well-being of the citizens and businesses of Missouri. Railroads play a major role in the movement of freight within and throughout the state and provide vital connections to the global marketplace. Because rail access is essential to many companies, improved rail service provides an important tool in Missouri's business development efforts. Passenger rail service provides an alternative for traveling between major economic centers and helps promote commerce and economic development, particularly in the areas adjacent to stations.

Detailed technical analyses can be found in separate technical memoranda which are posted at http://www.morail.org along with other plan-related documentation. The technical memoranda include the most current information and responses to comments received during the course of the project from stakeholders and the general public. The technical memoranda will be updated as needed to qualify present and future project components for funding applications to the Federal Railroad Administration (FRA). The plan and its supporting technical memoranda are intended to be living documents subject to modifications and improvements which will reflect changes to projects, and federal and regional programs designed to enhance rail services. MoDOT will update the state rail plan no less frequently than once every five years to meet the FRA requirements.

The plan development process included extensive involvement by the private sector, public officials, key stakeholders and the general public. The state rail plan also takes into account plans for other transportation modes, including public transit, highways, ports and waterways and air services.

The state rail plan establishes the following:

- A long-term vision for Missouri's rail system, consisting of an integrated freight and passenger rail network as part of a balanced statewide transportation system. The statewide transportation vision is defined in MoDOT's State Long-Range Transportation Plan;

- A recommended program of priority improvements over the next 20 years, including an estimate of needs and benefits resulting from those investments;
- Recommended potential approaches to financing these improvements, including accessing federal funds, public/private partnerships and alternative financing mechanisms; and
- Other suggested changes, including refinements to existing state rail programs and institutional responsibilities for rail service and infrastructure development.

1.1 Historical Highlights of Rail in Missouri

Missouri has a long history of railroad operations. The first railroad built in the state was a five-mile length of track laid from Richmond to the Missouri River sometime between 1849 and 1851. The line was entirely made of wood (including the rails) and horses pulled these trains. Railroad building began in earnest in the state in 1851 with the initiation of the construction of the Pacific Railroad in St. Louis, and in 1852 with the Hannibal and St. Joseph Railroad. The Hannibal and St. Joseph completed its line in 1859, making it the first railroad to cross Missouri. St. Joseph remained the westernmost city connected by rail throughout the Civil War. After the Civil War, steel rails spread quickly across the state to form the roots of a growing industry. Railroad mileage reached its peak in Missouri in the early 1920s when there were over 8,000 miles of railroad in the state. This number dropped to 7,042 in 1940 and has been gradually declining ever since.[1] There are approximately 4,000 miles of railroad in Missouri today.

Kansas City and St. Louis have historically been major points for the interchange of railroad traffic moving between the east and the west, and are ranked today as the second and third largest rail transportation centers in the United States, respectively.

1.2 Overview of Rail in Missouri Today

Rail is a major component of Missouri's passenger and freight transportation systems and plays a significant role in the state's economy. Passenger trains provide an alternative travel mode in the heavily traveled I-70 corridor between St. Louis and Kansas City. A substantial portion of the freight moving into, out of and through Missouri is carried on trains, and the economic viability of a wide variety of businesses in Missouri depends on the availability of rail service to transport raw materials and finished products.

1.2.1 Passenger Rail Service

During 2008 and 2009, major new federal funding support emerged for intercity passenger rail, which has fueled a regional and national resurgence of interest in improving passenger rail service. Missouri has been an active participant in the Midwest Regional Rail Initiative (MWRRI), a cooperative effort by nine states to develop a network of enhanced passenger rail service focused on a central hub in Chicago. The passenger rail services proposed by MWRRI would provide a significant potential economic benefit for Missouri. Reports prepared as part of MWRRI[2] demonstrate higher-speed rail would generate between $2 billion and $2.3 billion

[1] Kirkendall, Richard S. "A History of Missouri. Volume V: 1919 to 1953." University of Missouri Press. 2004.

[2] Economic Impacts of the Midwest Regional Rail System, Transportation Economics and Management Systems, Inc. and HNTB, November 2006.

dollars' worth of benefits to Missouri users in the form of time savings, congestion relief and emission reductions.

The St. Louis to Kansas City corridor is a key component of the MWRRI network, and the success of this corridor will ultimately be dependent on having faster, more frequent and reliable service through St. Louis to Chicago and other major cities in the Midwest. The MWRRI plan has determined a high-capacity, higher-speed rail transportation network is not only desirable, but affordable, and even preferable, as fuel prices rise and larger volumes of travelers shift to available rail services.

Missouri has been able to maintain existing passenger rail service with relatively modest federal grant and loan programs and state appropriations. Funds have been available to make improvements to at-grade crossings and provide support for economic development projects which have a rail component. The state provides some operating funds for the Amtrak Missouri River Runner service and has funded infrastructure improvements to the line on which those trains operate.

With the enactment of PRIIA in 2008, the federal government for the first time provided an authorization for a significant level of funding for passenger rail projects. In 2009, the American Recovery and Reinvestment Act (ARRA) appropriated $8 billion for passenger rail projects throughout the country. This was followed up with an additional appropriation of more than $2 billion in 2010. These actions at the federal level have set off a lively national competition for current and potential future funding.

Missouri has successfully applied for federal funding, receiving grant awards for passenger rail corridor improvements totaling nearly $179 million since 2007. Missouri has also partnered with Illinois, Michigan and Iowa to obtain a grant for $268 million for new passenger equipment. Missouri intends to continue to pursue federal funding for passenger rail improvement projects, and the adoption of this state rail plan is an essential ingredient for the success of this effort.

1.2.2 Freight Railroads

Freight railroads play a critical role in the transportation of goods in Missouri. Missouri ranks tenth in the United States in total miles of rail. According to the Association of American Railroads (AAR), Missouri ranks fourth in the country in the total tonnage of rail traffic originating, terminating or passing through the state.[3] In 2011, 304 million tons of freight was carried on railroads in Missouri. The primary commodities originating in Missouri are food products, farm products, intermodal, chemicals, motor vehicles and parts. Coal is the primary commodity terminating in Missouri, ranking the state third nationally for terminated rail tons of coal.[4] More than two-thirds of the rail freight traffic in Missouri has both its origin and destination outside of the state. Most of this pass-through traffic is coal. If all of this freight had been carried on trucks instead of trains, more than 20 million trucks would have been added to the highways in Missouri.

[3] Association of American Railroads, http://www.aar.org/Railroads-States/State-Rankings-2009.pdf

[4] Association of American Railroads, http://www.aar.org/Railroads-States/Missouri-2009.pdf

The rail industry itself has a significant impact on Missouri's economy, generating $2.8 billion in gross state product. More than 8,200 rail industry workers generated an estimated 17,985 indirect and induced jobs through industry and employee consumer spending.[5] The value of freight rail service to key Missouri export industries is significant. In 2006, $19.8 billion in commodity exports were shipped from Missouri. These exports generated $655.2 million in net Missouri general revenues, $8.7 billion in personal income, $13.4 billion in Gross State Product and $32.4 billion in total state output. These same rail-borne Missouri exports generate more than 234,000 direct, indirect and induced jobs within the state.[6]

1.3 The Benefits of Rail

Passenger and freight rail service in Missouri provides significant economic and environmental benefits to the state, which are briefly summarized here and addressed in further detail in Chapters 8 and 9 of this plan.

1.3.1 Economic Benefits

Efficient freight and passenger rail service provides important economic development benefits to Missouri communities. Industrial development can be thwarted by the lack of freight rail service. Freight rail service is a key location factor for many new companies seeking to locate or expand in Missouri.

Enhanced passenger rail service can provide important economic development benefits to Missouri communities by providing improved accessibility, connectivity and travel efficiency. An economic impact analysis has been prepared for the MWRRI plan which recommends 90 mph high-speed rail service on the St. Louis to Kansas City corridor and feeder bus service in other Missouri corridors. This analysis estimates improved passenger rail service in Missouri will result in 5,600 new permanent jobs, increased property values around Missouri stations and a $109 million increase in annual household income statewide.[7]

1.3.2 Environmental Benefits

Rail service provides important environmental benefits to Missouri residents. Rail can move freight three times more efficiently than trucks on a per ton-mile basis. The U.S Environmental Protection Agency (EPA) estimates a typical freight train emits only one-third of the pollution of a truck on a ton-mile basis.

Passenger rail travel has similar environmental benefits. Data from the Oak Ridge National Laboratory indicates intercity passenger rail consumes 17 percent less energy per passenger mile than airlines and 21 percent less energy per passenger mile than automobiles.[8] Intercity passenger rail produces 60 percent fewer carbon dioxide (CO_2) greenhouse gas emissions per passenger mile than the average automobile and about half (50 percent) of the greenhouse gas

[5] "Missouri Freight Transportation: Economy on the Move – Rail Freight", Missouri Economic Research and Information Center, 2010

[6] "The Economic Value of Investment in Freight Transportation: Missouri Rail", Missouri Economic Research and Information Center, June 2008

[7] Economic Impacts of the Midwest Regional Rail System, Transportation Economics and Management Systems, Inc. and HNTB, November 2006.

[8] Oak Ridge National Laboratory, Transportation Energy Data Book, Edition 26, 2007.

emissions per passenger mile of an airplane. Intercity passenger rail also generates fewer emissions per passenger mile of other pollutants such as nitrogen oxides (NOx), volatile organic compounds (VOCs) and carbon monoxide (CO).[9]

Intercity passenger rail service provides downtown to downtown connectivity encouraging urban infill and downtown redevelopment. This type of development is transit-friendly and is more energy efficient, resulting in fewer harmful emissions and the ability to more efficiently provide urban services than in areas of low-density suburban sprawl.

1.4 Federal Requirements

PRIIA encourages states to develop statewide rail plans to set policy involving freight and passenger rail transportation within their boundaries, establish priorities and implementation strategies to enhance rail service in the public interest, and serve as the basis for federal and state rail investments within the state. PRIIA requires states to have a current approved statewide rail plan in place to receive funding for capital investment grants to support intercity passenger rail service and higher-speed rail corridor development grants.

As defined in Section 303 of PRIIA, the purposes of a state rail plan are:

- To set forth state policy involving freight and passenger rail transportation, including regional/commuter rail operations.
- To establish the period covered by the state rail plan.
- To present priorities and strategies to enhance rail service in the state which benefit the public.
- To serve as the basis for federal and state rail investments within the state.

Section 303 of PRIIA provides specific requirements for elements to be included in a state rail plan. State rail plans are to address a broad spectrum of issues, including:

- An inventory of the existing rail transportation system and rail services and facilities within the state and an analysis of the role of rail transportation within the state's surface transportation system.
- A review of all rail lines within the state, including proposed high-speed rail corridors and significant rail line segments not currently in service.
- A statement of the state's passenger rail service objectives, including minimum service levels for rail transportation routes in the state.
- A general analysis of rail's transportation, economic and environmental impacts in the state, including congestion mitigation, trade and economic development, air quality, land use, energy use and community impacts.
- A long-range rail investment program for current and future freight and passenger infrastructure in the state, which includes:
    - A list of any rail capital projects expected to be undertaken or supported in whole or in part by the state.
    - A description of the public and private benefits of each project.

[9] "Vision for the Future – U.S. Intercity Passenger Rail Network Through 2050," prepared for the National Surface Transportation Policy and Revenue Study Commission, December 2007.

- A statement of the correlation between public funding contributions for the projects and the public benefits.
- A detailed funding plan for those projects which identifies both public (federal, state and local) and private sources of funds.

This Missouri State Rail Plan fully meets all of these federal requirements. **Table 1** identifies which section of this plan addresses each specific federal requirement.

Table 1: Missouri State Rail Plan Compliance with Federal Rail Plan Requirements

Federal Requirements	Missouri State Rail Plan Section
GENERAL REQUIREMENTS:	
1) Inventory of the existing rail transportation system and rail services and facilities within the state and an analysis of the role of rail transportation within the state's surface transportation system.	Section 2.0
2) Review of all rail lines within the state, including proposed high-speed rail corridors and significant rail line segments not currently in service.	Section 2.0
3) Statement of the state's passenger rail service objectives, including minimum service levels, for rail transportation routes in the state.	Section 1.6
4) General analysis of rail's transportation, economic, and environmental impacts in the state, including congestion mitigation, trade and economic development, air quality, land-use, energy-use, and community impacts.	Section 8.0 Section 9.0
5) Long-range rail investment program for current and future freight and passenger infrastructure in the state which meets the requirements of subsection (b).	Section 8.2
6) Statement of public financing issues for rail projects and service in the state, including a list of current and prospective public capital and operating funding resources, public subsidies, state taxation, and other financial policies relating to rail infrastructure development.	Section 6.0 Section 10.0
7) Identification of rail infrastructure issues within the state which reflects consultation with all relevant stakeholders.	Section 7.0 Section 8.0
8) Review of major passenger and freight intermodal rail connections and facilities within the state, including seaports, and prioritized options to maximize service integration and efficiency between rail and other modes of transportation within the state.	Section 2.1
9) Review of publicly funded projects within the state to improve rail transportation safety and security, including all major projects funded under Section 130 of Title 23.	Section 2.4
10) Performance evaluation of passenger rail services operating in the state, including possible improvements in those services, and a description of strategies to achieve those improvements.	Section 2.3 Section 10.0

Federal Requirements	Missouri State Rail Plan Section
11) Compilation of studies and reports on high-speed rail corridor development within the state not included in a previous plan under this subchapter, and a plan for funding any recommended development of such corridors in the state.	Section 5.0 Section 8.0 Section 10.0
12) Statement of compliance with the requirements of Section 22102.	Cover Letter
LONG-RANGE SERVICE AND INVESTMENT PROGRAM:	
1) PROGRAM CONTENT:	
(A) List of any rail capital projects expected to be undertaken or supported in whole or in part by the state.	Section 8.0
(B) Detailed funding plan for those projects.	Section 8.0
PROJECT LIST CONTENT:	
(A) Description of the anticipated public and private benefits of each project.	Section 8.0 Section 9.0
(B) Statement of the correlation between public funding contributions for the projects and the public benefits.	Section 8.0
CONSIDERATIONS FOR PROJECT LIST:	
(A) Contributions made by non-federal and non-state sources through user fees, matching funds, or other private capital involvement.	Section 8.0
(B) Rail capacity and congestion effect.	Section 4.0 Section 8.0
(C) Effects on highway, aviation, and maritime capacity, congestion, or safety.	Section 8.1
(D) Regional balance.	Section 9.7
(E) Environmental impact.	Section 9.0
(F) Economic and employment impacts.	Section 8.0
(G) Projected ridership and other service measures for passenger rail projects.	Section 8.0

The state rail plan must be coordinated with other state transportation planning programs and clarify long-term service and investment needs and requirements. States also are directed to review the freight and passenger rail service activities and initiatives by regional planning agencies, regional transportation authorities, and municipalities within the state, or in the region in which the state is located, while preparing the plan. States must also include in the plan any recommendations made by such agencies, authorities, and municipalities as deemed appropriate by the state.

States are required to provide adequate and reasonable notice and opportunity for comment and other input to the public, rail carriers, commuter and transit authorities operating in, or

affected by, rail operations within the state, units of local government, and other interested parties in the preparation and review of its state rail plan.

PRIIA also directs the Administrator of the FRA to develop a Preliminary National Rail Plan to address the rail needs of the nation. The FRA was directed to provide assistance to states in developing their state rail plans to ensure the federal long-range National Rail Plan is consistent with approved state plans. The traditional role of the FRA has been to promote and oversee railroad safety, and safety remains a focus. PRIIA gave the FRA additional broad responsibilities to administer and manage grants for rail transportation projects.

1.5 Vision for Missouri Rail Service

MoDOT created a State Rail Plan Advisory Committee to kick off the initial rail planning efforts. The following is the vision statement developed by the committee:

Missouri's rail vision is to provide safe, environmentally-friendly transportation options supporting efficient movement of freight and passengers, while strengthening communities and advancing global competitiveness through intermodal connectivity.

1.6 Goals and Objectives

MoDOT has developed Tracker to identify and monitor performance measures for delivering efficient and practical transportation services.[10] Tracker is built around 18 Tangible Results which cover all areas of MoDOT's service delivery. Performance measures directly related to MoDOT's rail transportation services can be found in four of these Tangible Result areas:

- Advance Economic Development
- Environmentally and Socially Responsible
- Efficient Movement of Goods
- Easily Accessible Modal Choices

The following goals and objectives have been developed to direct MoDOT efforts toward achieving its rail vision:

Goal: Promote the Efficient Movement of Passengers

Objectives:

1. Provide new and enhanced passenger rail service to Missouri communities and travelers as an efficient and cost-effective mobility alternative.
2. Reduce travel times through increased speeds and reduced delay.
3. Increase frequencies on the existing route.

[10] Missouri Department of Transportation, Tracker, http://www.modot.mo.gov/about/general_info/Tracker.htm

4. Improve reliability and performance.
5. Improve the traveler efficiency and comfort by providing amenities such as food service, internet connectivity, 110-volt power for electronic devices, and video information displays onboard and at stations.
6. Increase passenger rail accessibility to low income, elderly and special needs groups which have limited access to auto and other modes.

Goal: Promote the Efficient Movement of Freight

Objectives:

1. Promote public policies which support frequent, reliable and efficient freight rail service to un-served or under-served communities, businesses and shippers.
2. Support policies which have the potential to increase total freight tonnage carried by rail.
3. Provide public investments for railroad projects where public benefits exceed public costs.
4. Pursue public-private partnerships to improve service and reduce freight rail congestion.

Goal: Encourage Intermodal Connectivity

Objectives:

1. Support the development of intermodal freight facilities to provide seamless connectivity between rail, truck, and water modes and increase access to global markets. Focus on facilities with the greatest potential to increase efficiency and accessibility to rail and provide lower transportation costs for shippers.
2. Support the connectivity of Missouri passenger rail service to other corridors regionally, nationally, and internationally to maximize network benefits in terms of increased ridership, revenues and passenger mobility.
3. Support intermodal connectivity between intercity passenger rail and other passenger modes including air, local transit, auto, intercity bus, and non-motorized transportation. Focus on intermodal investments with the greatest potential to increase the efficiency of rail.

Goal: Enhance State and Local Economic Development

Objectives:

1. Promote freight rail service, infrastructure improvements, and intermodal connectivity to increase the efficiency of freight rail service, lower transportation costs for Missouri businesses and provide increased access to global markets.
2. Promote state policies and programs to provide increased freight rail service to Missouri communities and businesses as a means of increasing their attractiveness for the expansion of existing businesses and the recruitment of new businesses.
3. Provide enhanced passenger rail service to Missouri communities as a part of an overall economic development strategy to increase employment, household incomes and property values based on the increased accessibility and mobility provided by the rail mode.

Goal: Promote an Environmentally and Socially Responsible Rail Transportation Development

***Objectives**:*

1. Support enhanced freight and passenger rail service as a part of an overall state energy conservation policy to protect Missouri travelers and shippers from the adverse mobility and economic impacts of expected increases in future transportation energy costs.
2. Support enhanced freight and passenger rail service as a means of reducing fuel consumed per ton- and per passenger-mile.
3. Support enhanced freight and passenger rail service as a means of reducing carbon emissions per ton- and per passenger-mile.
4. Support intermodal connectivity between intercity passenger rail and other passenger modes including air, local transit, auto, intercity bus and non-motorized transportation to provide greater accessibility to travelers, including those with low incomes, special needs and limited access to automobile transportation.

Goal: Promote Safe and Secure Railroad Operations

Objectives:

1. Promote rail and highway safety by improving grade crossing surfaces and warning devices and pursuing road closures and grade separations where appropriate.
2. Promote the safe transportation of hazardous materials via railroads.
3. Promote cooperative efforts with Amtrak and freight railroads to enhance the security of passenger and freight railroad operations.

1.7 Organization of the Plan

This Missouri State Rail Plan consists of the following chapters:

- **Chapter 1 Introduction and Vision** provides past and current highlights of Missouri's rail system, as well as the vision, goals and objectives of the state rail plan.
- **Chapter 2 Existing Conditions** provides a profile of the existing freight and passenger rail systems, a summary of relevant federal and state funding programs, and a summary of relevant previous studies.
- **Chapter 3 Economic Conditions and Forecast** describes the shifts in Missouri inbound and outbound freight flows providing the context to understand the changing role of freight rail in Missouri's economy and the state's economic restructuring.
- **Chapter 4 Evaluation of Missouri's Rail Capacity** provides information on the current and projected capacity constraints of Missouri's rail system, which may impact the ability of the railroads to move passenger and freight trains in a timely manner.
- **Chapter 5 Previous Studies** provides a summary of local, regional, statewide and national studies previously completed, which cover some aspect of Missouri's rail service.
- **Chapter 6 Funding and Organizational Opportunities** provides information on public/private partnerships, potential funding sources and institutional guidance.
- **Chapter 7 Outreach Activities** summarizes public participation and stakeholder involvement in preparing the plan.

- **Chapter 8 Financial Analysis of Needs** and Benefits discusses development of potential projects and programs, packages of projects evaluated and unmet needs, and the potential economic benefits of rail system investment.
- **Chapter 9 Other Social Benefits** of Rail Investments describes, in general, the potential environmental, transportation, land use and community resources and other social benefits of rail system investment.
- **Chapter 10 Recommendations** summarizes the recommended projects, funding sources and next steps for plan implementation.

A series of Technical Memoranda are being prepared which provide further background information and detail regarding these topics. They are as follows:

- Technical Memorandum #1: The Vision, Goals and Objectives for Rail Transportation in Missouri
- Technical Memorandum #2: Existing Conditions Report
- Technical Memorandum #3: Funding Opportunities, Policy Guidelines and Institutional Considerations
- Technical Memorandum #4: Rail Asset Management Business Plan
- Technical Memorandum #5: Economic Analysis of Rail Investments
- Technical Memorandum #6: Public and Stakeholder Engagement Summary Report (available May 2012)

As previously noted, these Technical Memoranda can be found on the MoDOT website at http://www.morail.org along with other plan-related documentation.

2.0 Existing Conditions

2.1 Freight Rail System Profile

There are a total of 19 railroad companies operating on tracks within the state of Missouri (see **Figure 1**). **Table 2** provides a listing of the number of miles of track operated by each railroad in Missouri. Railroad companies are typically described in three general categories based on their size and type of operations:

2.1.1 Class I Railroads

U.S. Class I Railroads are large line haul freight railroads with a 2009 operating revenue of $378.8 million or more. There are seven Class I Railroads in the United States, and six of them own tracks or have operating rights in Missouri. These include:

- Burlington Northern Santa Fe Railway (BNSF)
- CSX Transportation (CSX) (trackage rights only in Missouri)
- Kansas City Southern Railway (KCS)
- Norfolk Southern Railway (NS)
- Soo Line Corporation (the U.S. operating arm of Canadian Pacific (CP))
- Union Pacific Railroad (UP)

The Canadian National Railroad (CN) (which operates in the U.S. as the Grand Trunk Corporation) is the only U.S. Class I railroad without operations in Missouri.

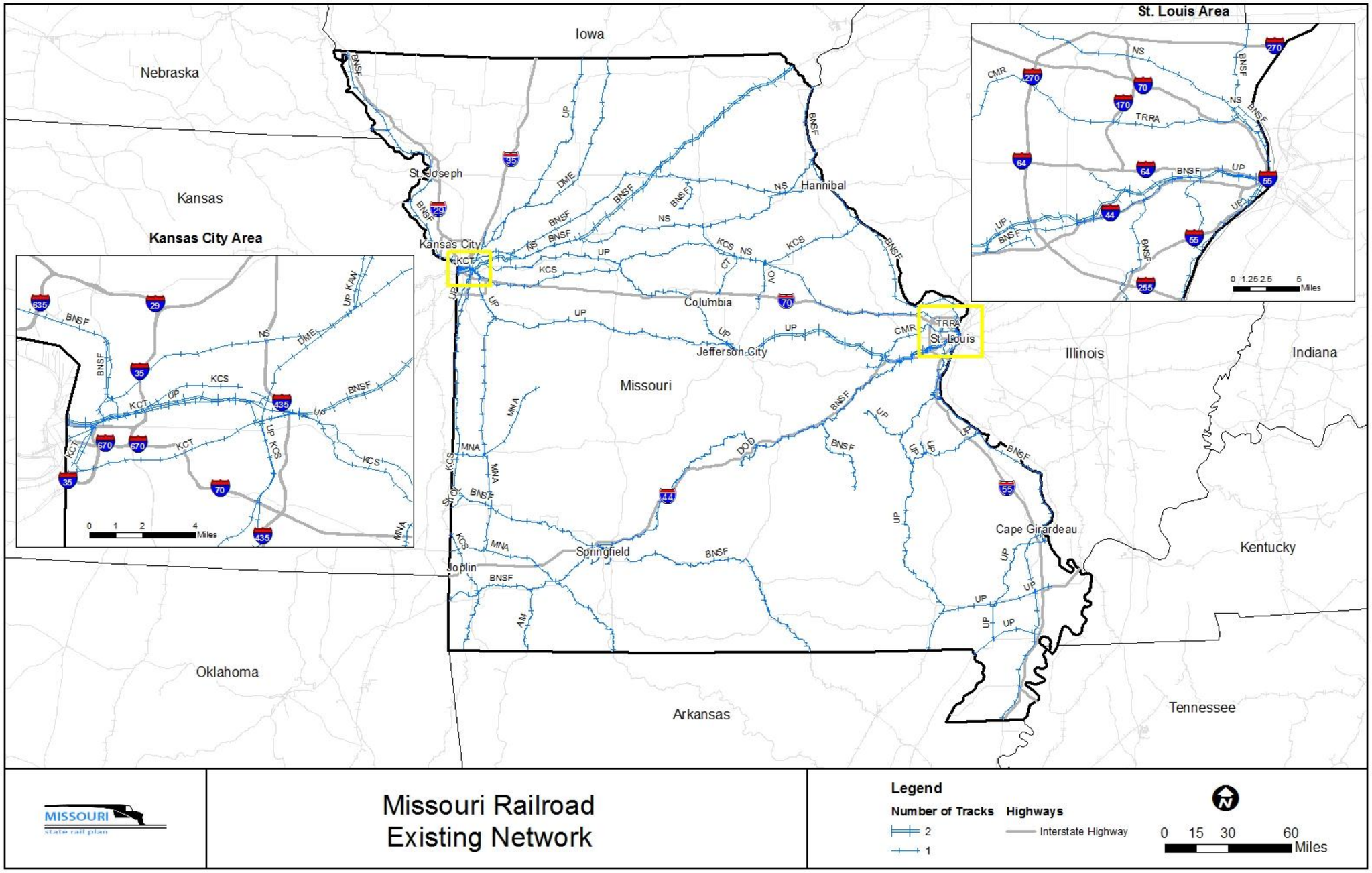
2.1.2 Switching & Terminal Railroads

Switching and Terminal (S&T) Railroads perform pickup and delivery services within a port or industrial area, or move traffic between other railroads. These railroads do not provide point-to-point transportation; rather they provide connecting services to get freight to and from its ultimate origin or destination. Missouri has eight S&T railroads:

- Central Midland Railway (CMR)
- Columbia Terminal (COLT)
- Kansas City Terminal Railway Company (KCT)
- Manufacturers Railway Company (MRS)
- Missouri & Valley Park Railroad (MVP)
- Missouri North Central Railroad (MNC)
- Semo Port Railroad (SE)
- Terminal Railroad Association of St. Louis (TRRA)

The KCT and TRRA are both multi-state operations which play a key role in moving trains from, to, and through their respective metropolitan areas.

Figure 1: Missouri Railroad Existing Network



2.1.3 Local Railroads

Local railroads are short line haul railroads which generally have annual revenues of less than $40 million per year. Seventy-five percent of the more than 300 local railroads which operate in the U.S. have fewer than 100 miles of railroad line. Missouri is served by five local railroads:

- Arkansas & Missouri Railroad (AM)
- Kaw River Railroad (KAW)
- Missouri & Northern Arkansas Railroad (MNA)
- Ozark Valley Railroad (OVRR)
- South Kansas & Oklahoma Railroad (SKOL)

Table 2: Railroads Operating in Missouri

Railroad	Acronym	Miles Owned	Operating Rights	Total Miles
Class I Railroads				
BNSF Railway Company	BNSF	1,593	166	1,759
CP/Soo Line Corp. (Formerly Iowa, Chicago & Eastern RR)	CP/SOO	139	5	144
CSX Transportation	CSX	0	13	13
Kansas City Southern Railway	KCS	396	0	396
Norfolk Southern Corp.	NS	344	65	409
Union Pacific Railroad	UP	986	511	1,497
Total Class I		**3,458**	**760**	**4,218**
Switching & Terminal Railroads				
Central Midland Railway	CMR	52	0	52
Columbia Terminal	COLT	22	0	22
Kansas City Terminal Railway Co.	KCT	32	0	32
Manufacturers Railway Co.	MRS	4	3	7
Missouri & Valley Park Railroad Corp.	MVP	27	0	27
Missouri North Central Railroad	MNC	4	0	4
Semo Port Railroad, Inc.	SE	8	0	8
Terminal Railroad Assn. of St. Louis	TRRA	26	0	26
Total Switching & Terminal Railroads		**175**	**3**	**178**
Local Railroads				
Arkansas & Missouri Railroad	AM	33	0	33
Kaw River Railroad	KAW	21	0	21
Missouri & Northern Arkansas Railroad	MNA	331	0	331
Ozark Valley Railroad, Inc.	OVRR	25	8	33
South Kansas & Oklahoma RR	SKOL	8	0	8
Total Local Railroads		**418**	**8**	**426**
Total Rail Miles in Missouri		**4,051**	**771**	**4,822**

2.1.4 Abandonments

Missouri has only half as many railroad track miles as it did during the peak of the railroad era in the 1920s. The loss of railroad track miles has the potential to cause economic damage to those communities and businesses which have been dependent on the services the railroads provide. While the number and length of abandonments have been reduced over the past 10 years, there are still some rail lines in the state which have the potential to become abandoned due to poor track and market conditions. Rail lines over which no local traffic has moved for two years without any formal complaint are exempt from the traditional process and can be abandoned simply by filing a notice with the Surface Transportation Board (STB).

Under the Interstate Commerce Commission's Termination Act of 1995, a railroad may abandon a line only with the permission of the STB. The STB must determine whether the "present or future public convenience and necessity require or permit" the abandonment. In making this determination, the STB balances two competing factors. The first is the need of local communities and shippers for continued service. Second is to determine if the needs of shippers are balanced against the public interest in releasing railroads from financial burdens which are a drain on their overall financial health and lessen their ability to operate economically elsewhere.

Since 1949, 124 separate Missouri rail line abandonments have been approved by the United States STB or its predecessor agency the Interstate Commerce Commission (ICC). The total length of railroad abandoned during this period is approximately 2,463 miles. The Staggers Rail Act of 1980 removed many regulatory restraints on the industry, making it easier for railroads to abandon redundant or light-density lines.[11] The number and length of abandonments have slowed over the past 10 years, with the state seeing only 10 abandonments for a total of 55 miles since 2002. A complete list of Missouri railroad abandonments since 1949 is provided in **Technical Memorandum #3: Existing Conditions Report**.

2.1.5 Intermodal Facilities

An intermodal facility is a location where freight is moved between multiple modes of transportation (rail, ship/barge, truck and air) in containers or vehicles. These facilities are equipped with machines to reduce cargo-handling time, thereby increasing the throughput in transporting freight faster. These facilities are operated with the help of movers, shippers, providers, and users of goods. Intermodal connectors may or may not be part of the National Highway System (NHS), but they can be connected to it through city, county or state roads.

NHS intermodal connectors are critical components of the nation's freight system, tying modes together and facilitating distribution of products to users. They are key links for ensuring the U.S. transportation system seamlessly moves goods within regions, across the country and throughout the world. There are 21 identified Missouri intermodal connectors on the NHS network. Intermodal connectors to rail-related facilities make up about two-thirds of the Missouri total.

[11]Federal Railroad Administration, http://www.fra.dot.gov/downloads/policy/staggers_rail_act_impact.pdf

2.1.6 Port Facilities

Missouri has six public ports located along the Mississippi River and five more are currently in the development stage. The state has three public ports along the Missouri River. There are also more than 200 private port facilities in the state. The following public ports have direct access to rail services:

1. Pemiscot County Port Authority operates a slack water harbor on the Mississippi River between Hayti and Caruthersville. A six mile rail spur between Hayti and the port was completed in 2010 to provide a direct connection with BNSF.
2. The Southeast Missouri Regional Port Authority operates the Semo Port in Scott City. The authority owns and operates the Semo Port Railroad, which provides switching service and connections with UP and BNSF.
3. The New Madrid County Port Authority is on the Mississippi River 175 miles south of St. Louis. The port has direct rail access to UP.
4. The St. Louis Municipal River Terminal is served by the TRRA, which provides direct access to BNSF, UP, NS and CSX.
5. The Kansas City Port Authority operates a large port facility at the confluence of the Missouri and Kansas rivers. The terminal is served by UP and has extensive rail track at the facility for loading and unloading.

2.2 Freight Rail Traffic

The freight rail system provides significant support for economic activity in the state of Missouri. This section discusses freight rail in more detail focusing on the integral role of commodities shipped by rail to, from, through and within the state. An analysis of the volume of rail freight in Missouri was performed utilizing 2006 and 2009 Waybill data provided by the Surface Transportation Board (STB) and extrapolated 2011 rates based on freight growth patterns developed through the Impact Analysis for Planning Group's (IMPLAN) and Moody's forecasts.

2.2.1 Economic Value-Chain Dependency on Rail

In addition to supporting Missouri's economic base, the rail transportation system supports earnings, output, and employment to many sectors of the state's economy. **Table 3**, **Table 4** and **Table 5** below present the overall national earnings output and employment directly supported by commodities shipped by rail into, within and out of Missouri, respectively, based on input-output parameters from the IMPLAN Group as applied in Economic Development Research (EDR) Group's Transportation Economic Development Impact System[12] (TREDIS) software application. For each type of movement, the top 10 dependent industries are described (based on the number of industry jobs associated with rail commodity flows). The numbers given reflect the estimated total annual dollars of output, value added or personal income which are enabled by rail flows, and total number of jobs which are associated with rail-dependent production. The tables also show the percentage of all freight made or used by a given industry utilizing Missouri's rail network as some part of its value chain or supply chain.

[12] TREDIS Consulting Group; Division of Economic Development Research Group, Inc. Web: http://www.tredis.com.

The findings show a large share (more than one-fifth) of the commodity inputs needed to support Missouri's transportation, crop production and administrative and support jobs are dependent on rail movements into the state. Furthermore, nearly half of the tonnage made by Missouri's transportation equipment sector, more than a third of the tonnage generated by Missouri's crop production industry, and a quarter of tonnage produced by Missouri's machinery manufacturing sector rely on outbound rail access Inbound coal plays a significant role in supporting Missouri's utility industry and outbound non-metallic minerals support considerable output and earnings in the mining and mineral industries.

Table 3: Rail Inbound Dependency for Missouri Industries

NAICS	Industry Description	Output Share of Rail Shipped Commodities ($m)	Employment Output Share of Rail Shipped Commodities	Wage Income Share of Rail Shipped Commodities ($m)	% Rail of All Modes
920	Government and non NAICS	$2,512	35,300	$1,870	18%
230	Construction	$2,119	16,286	$772	13%
481-487	Transportation	$1,985	13,171	$703	33%
561	Administrative and Support Services	$699	11,349	$357	27%
621-624	Health Care and Social Services	$893	10,674	$471	11%
111	Crop Production	$567	7,229	$47	23%
441-454	Retail Trade	$393	6,104	$162	14%
336	Transportation Equipment	$4,109	5,517	$561	17%
721-722	Accommodations, Eating and Drinking	$303	5,449	$100	6%
811-812	Repair, Maintenance & Personal Services	$384	4,421	$127	13%
	All Others	$10,548	34,933	$1,928	12%
	Total	$24,512	150,433	$7,098	15%

Source: EDR TREDIS System (From FAF3 and vectors from Missouri IMPLAN Group); 2010 dollars

Analysis of the role of rail imports from other states and countries in Missouri's economy, as indicated in **Table 3**, shows more than 150,000 Missouri jobs are in value chains relying directly on commodities imported to the state by rail. Twenty eight percent of these jobs are associated with construction, transportation, crop production, and transportation equipment production industries. Rail freight transportation is also important to non-manufacturing sectors of the Missouri economy. Seventeen percent of rail-related employment is associated with service sector industries including administrative services; health care; and repair, maintenance and

personal services. Furthermore, more than 35,000 government sector jobs rely on commodities brought into the state by rail. This points to the importance of rail freight for non-manufacturing sectors of the economy.

Rail transportation is less critical to internal shipments within the state and supports less employment. Employment associated with crop production and animal production industries in Missouri's rural economy rely most on internal rail movement within the state, as shown in **Table 4**.

Table 4: Rail Internal Dependency for Missouri Industries

NAICS	Industry Description	Output Share of Rail Shipped Commodities ($m)	Employment Output Share of Rail Shipped Commodities	Wage Income Share of Rail Shipped Commodities ($m)	% Rail of All Modes
111	Crop Production	$19	235	$2	1.6%
112	Animal Production	$4	49	$0	0.2%
721-722	Accommodations, Eating and Drinking	$2	33	$1	0.1%
230	Construction	$4	33	$2	0.1%
311	Food Products	$17	31	$2	0.3%
920	Government and non NAICS	$2	31	$2	0.1%
621-624	Health Care and Social Services	$2	25	$1	0.1%
321	Wood Products	$3	16	$1	0.8%
441-454	Retail Trade	$1	11	$0	0.1%
531	Real Estate	$2	7	$0	0.6%
	All Others	$20	51	$3	0.1%
	Total	$76	522	$14	0.2%

Source: EDR TREDIS System (From FAF3 and vectors from Missouri IMPLAN Group); 2010 dollars

An analysis of rail freight shipped out of Missouri, as indicated in **Table 5**, shows employment in many of Missouri's basic industries involve significant jobs associated with commodities shipped out of the state by rail, with a total of approximately 67,308 jobs in some way involving commodities exported by rail. In addition to a large share of employment associated with outbound crop production sector products, significant numbers of high paying jobs in Missouri manufacturing sectors such as transportation equipment and machinery manufacturing are associated with products carried from Missouri to national markets using the rail system.

Table 5: Rail Export Dependency for Missouri Industries

NAICS	Industry Description	Output Share of Rail Shipped Commodities ($m)	Employment Output Share of Rail Shipped Commodities	Wage Income Share of Rail Shipped Commodities ($m)	% Rail of All Modes
111	Crop Production	$2,242	28,572	$184	34%
336	Transportation Equipment	$13,682	18,367	$1,869	48%
333	Machinery Manufacturing	$4,153	12,438	$755	25%
311	Food Products	$1,749	3,161	$165	11%
332	Fabricated Metal Products	$304	1,122	$66	5%
321	Wood Products	$92	591	$19	9%
325	Chemical Manufacturing	$655	540	$54	4%
212-213	Mining and Support Activities	$130	373	$37	19%
326	Plastics and Rubber Products	$97	350	$19	3%
211	Oil and Gas Extraction	$131	315	$6	2%
	All Others	$988	1,480	$126	1%
	Total	$24,223	67,309	$3,300	15%

Source: EDR TREDIS System (From FAF3 and vectors from Missouri IMPLAN Group); 2010 dollars

While the actual tonnage of commodities entering and leaving Missouri by rail accounts for only 10 percent of commodities on Missouri's overall transportation system; the above analysis shows how, in value-chain terms, a significant amount of employment and value-added activity involves work and services performed with these goods.

2.3 Passenger Service Profile

Intercity passenger rail service is provided in Missouri on four different routes operated by the National Railroad Passenger Corporation (Amtrak) as shown in **Figure 2**. Missouri is currently served by Amtrak passenger trains on two regional routes and two long distance routes.

2.3.1 Current Amtrak Service

Missouri River Runner. The Missouri River Runner is supported by the state and provides service between St. Louis and Kansas City on two round trips per day. Trains take approximately 5 hours and 40 minutes to travel the 283 miles between the two largest cities in Missouri. The River Runner trains serve stations in Kirkwood, Washington, Hermann, Jefferson

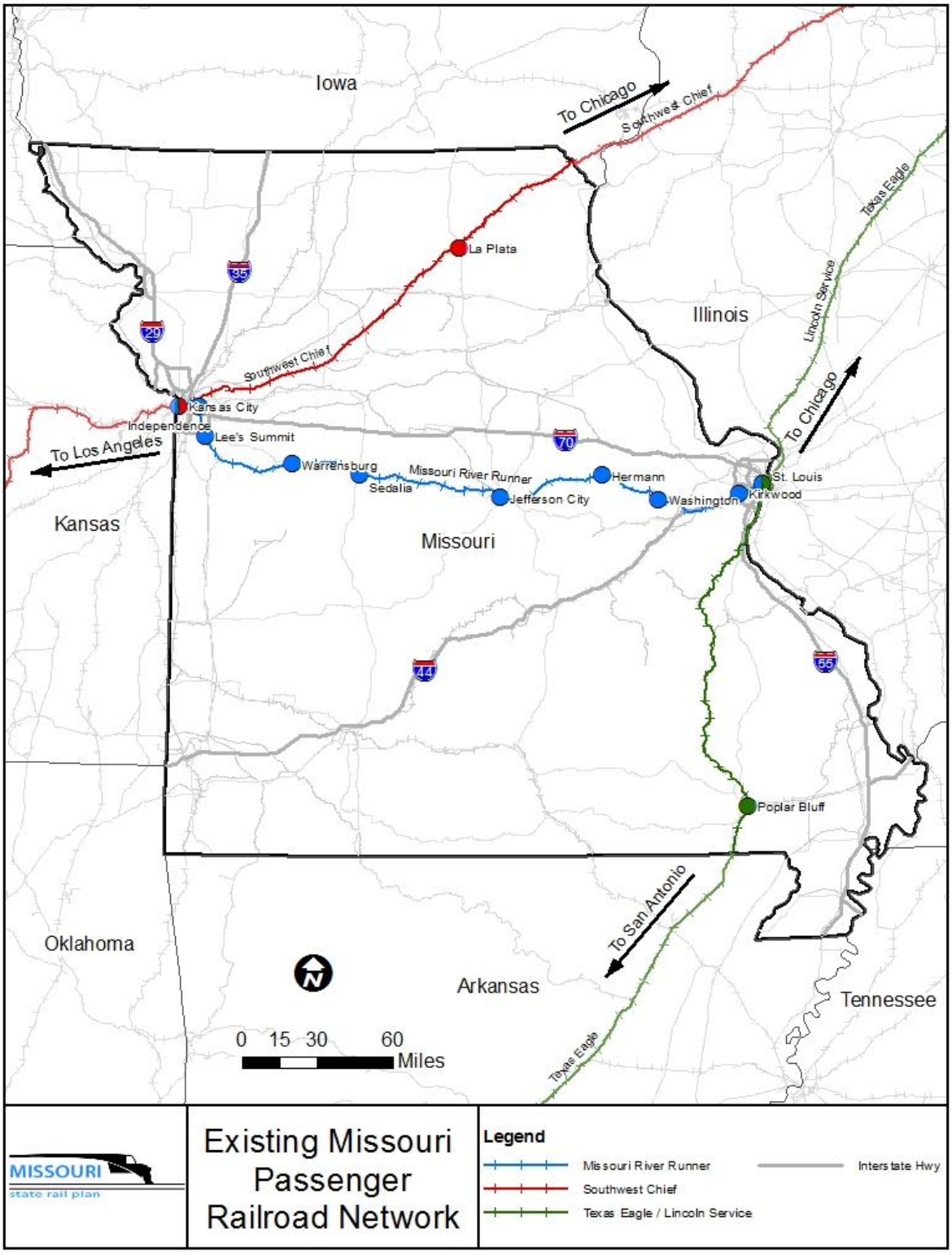
City, Sedalia, Warrensburg, Lee's Summit and Independence. The state of Missouri provides more than $8 million a year to Amtrak to subsidize the operation of this train.

Lincoln Service. The Lincoln Service is supported by the state of Illinois and offers service on four daily round trips between Chicago and St. Louis. A fifth daily train, the long distance Texas Eagle (see below) also operates between these two cities. Trains currently take approximately 5 hours 40 minutes to travel the 284 miles between these two cities. While a significant portion of the riders on these trains are coming from or going to St. Louis, Missouri does not provide any state subsidy for this service. The Lincoln Service trains serve nine Illinois stations between the two end cities, including Springfield, Bloomington – Normal and Joliet. The federal government and the state of Illinois have committed more than $1 billion to upgrade this corridor for high speed service. Work on these improvements began in 2010 and when they are completed trains will be able to operate at 110 mph and travel times between Chicago and St. Louis will be reduced by more than one hour.

Southwest Chief. Amtrak's Southwest Chief provides service with one round trip per day between Chicago and Los Angeles. The train makes two stops in Missouri at La Plata and Kansas City. The Southwest Chief provides service to the following key stations outside of Missouri: Chicago; Topeka, Kansas; Albuquerque, New Mexico; Flagstaff, Arizona; Williams Junction, Arizona (Grand Canyon); and Los Angeles.

Texas Eagle. The Texas Eagle provides daily service between Chicago to San Antonio. The Texas Eagle makes two stops in Missouri; St. Louis and Poplar Bluff. Key stations outside of Missouri served by the Texas Eagle include: Chicago; Springfield, Illinois; Little Rock, Arkansas; and the Texas cities of Dallas, Fort Worth, Austin and San Antonio. Passengers can continue on the Sunset Limited at San Antonio and have service to Los Angeles via El Paso, Texas; Tucson, Arizona; and Palm Springs, California.

Figure 2: Existing Missouri Passenger Rail Network



2.3.2 Passenger Rail Utilization

According to Amtrak statistics, intercity passenger rail ridership for stations in Missouri has increased from 337,334 in FY 2007 (July 1, 2006 – June 30, 2007) to 492,793 in FY 2011, an increase of 46.1 percent (See **Table 6** and **Figure 3**).

The Missouri River Runner saw an increase of more than 72.8 percent during the last five years. The number of Missouri riders on the Lincoln Service increased by more than 46 percent during the last five years. The Lincoln saw a loss of ridership during FY 2011, primarily as a result of the delays and slow orders associated with the high speed rail construction projects in Illinois. This improvement in service is expected to result in a rapid increase in ridership when the work is completed.

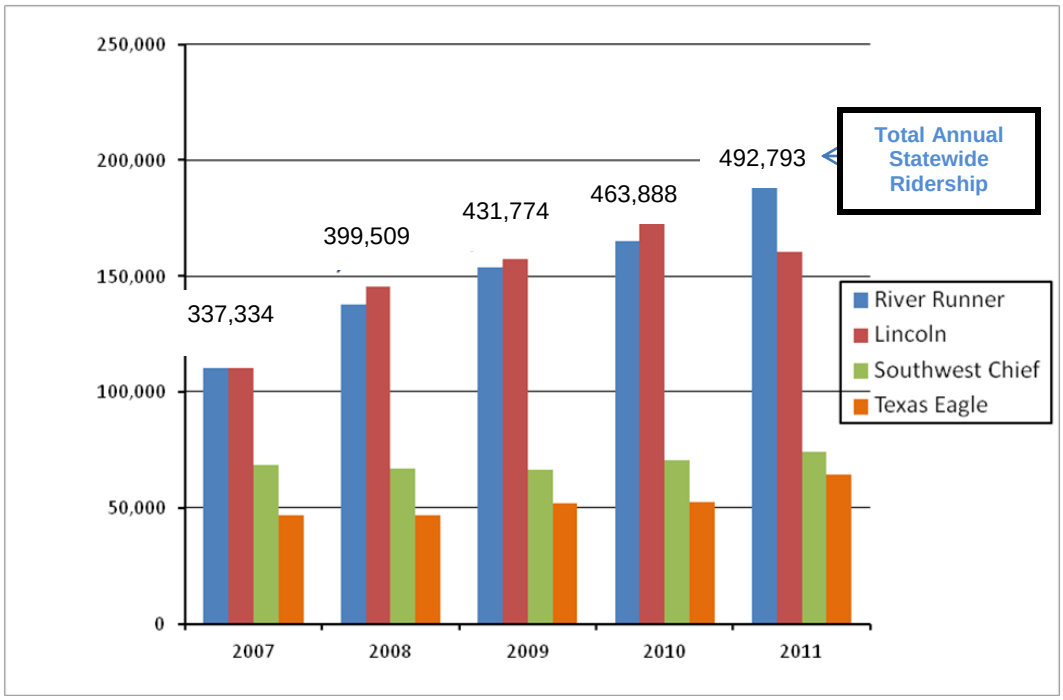
Table 6: Total Missouri Passenger Rail Ridership by Rail Line and Fiscal Year

Year	River Runner		Lincoln		Southwest Chief		Texas Eagle		Total Ridership	
	Riders	% Change	Riders	% Change	Riders	% Change	Riders	% Change	Riders	% Change
FY2007	110,312	--	110,111	--	69,678	--	47,233	--	337,334	--
FY2008	137,713	24.8%	145,576	32.2%	68,406	-1.8%	47,814	1.2%	399,509	18.4%
FY2009	153,482	11.5%	157,468	8.2%	67,925	-0.7%	52,899	10.6%	431,774	8.1%
FY2010	164,817	7.4%	173,448	10.1%	72,049	6.1%	53,574	1.3%	463,888	7.4%
FY2011	190,628	15.7%	160,876	-7.2%	75,678	5.0%	65,611	22.5%	492,793	6.2%
FY2007-FY2011		**72.8%**		**46.1%**		**8.6%**		**38.9%**		**46.1%**

Source: Amtrak Fiscal Year: July 1 – June 30

Ridership to and from Missouri on Amtrak's long distance routes also increased over the past five years. The Texas Eagle had a 38.9 percent increase in ridership over the past five years, and the St. Louis to Little Rock city pair saw an increase of more than 100 percent. Missouri ridership growth on the Southwest Chief has been much more modest, with a total growth of 8.6 percent between FY 2007 and FY 2011.

Figure 3: Missouri Passenger Rail Ridership by Rail Line Fiscal Years 2007-2011



3.0 Economic Conditions and Forecast

Since the official U.S. Department of Transportation (U.S. DOT) Federal Freight Analysis Framework Version 3 (FAF3) forecast was published based on 2007 Commodity Flow Survey (CFS) data, many aspects of the U.S. economy have restructured. The anticipated growth of many industries using Missouri's rail service is now different from what it was then, as is the anticipated growth of many of Missouri's rail trading partners. For this reason, an updated forecast is provided for Missouri's rail plan using 2006 and 2009 Waybill data from the STB as a base, and applying growth rates from Moody's/Economy.com privately syndicated forecast estimates of Missouri industry growth in relation to its rail trading partners. The forecasts presented in this chapter show the results of the Moody's forecast for Missouri and all of its trading partners, but still rely on FAF3 for background information about international and through flows.

Table 7 and **Table 8** summarize the significant shifts in Missouri inbound and outbound freight anticipated by the Moody's forecast to the year 2031. The tables show the five Missouri rail export and import commodities forecast to experience the largest growth in tonnage from 2011 to 2031. These forecasts provide context for understanding the changing role of rail freight in Missouri's economy, and will be interpreted critically in the subsequent section with regard to Missouri's economic restructuring.

Table 7: Imports to Missouri by Commodity Group (2011-2031) - Domestic and International Combined

Top Increasing/ Declining Flows	Commodity	Net Change in Tonnage	Compound Annual Growth Rate
Five Most Increasing Commodity Flows 2011-2031	Fabricated Metal Products	39,172	10.7%
	Miscellaneous Freight Shipments	192,267	10.1%
	Hazardous Materials	1,633,298	5.1%
	Electrical Machinery, Equipment, or Supplies	12,444	4.3%
	Containers, Carriers or Devices, Shipping, Returned Empty	33,637	4.1%
Five Most Decreasing Commodity Flows 2011-2031	Leather or Leather Products	(15)	-3.6%
	Apparel or Other Finished Textile Products	(983)	-1.9%
	Furniture or Fixtures	(276)	-1.2%
	Printed Matter	(143)	-0.9%
	Lumber or Wood Products, excluding Furniture	(100,811)	-0.6%
Other Flows	*All Other Commodities*	*24,519,548*	*1.6%*
Total Forecast Change	All Commodities	26,328,139	1.7%

Source: 2006 and 2009 STB Waybill (Extrapolated Based on IMPLAN and Moody's Forecast)

The forecast anticipates an increase in more than 26 million tons of additional rail imports to Missouri in 2031 from 2011, as shown in **Table 7**. This represents a compounded annual increase in Missouri's rail imports of 1.7 percent. Commodities likely to experience the greatest rate of increase among Missouri's rail imports are fabricated metal products and "miscellaneous freight" shipments. The forecast also suggests growth in markets shipping hazardous materials, as well as increases in electrical machinery and empty containers coming into the state. Much of the growth in rail imports of this type is based on growth in the economic forecast for those partners from whom Missouri is importing these goods.

As shown in **Table 8**, the forecast anticipates a significant rate of increase in rail exports of electrical machinery, equipment or supplies; empty containers, carriers or shipping devices; chemicals and allied products, fabricated metal products and transportation equipment. The forecast anticipates declines in Missouri's use of rail to export textiles and apparel, as well as lumber or wood products and furniture and pulp and paper products.

Table 8: Exports from Missouri by Commodity Group (2011-2031) - Domestic and International Combined

Top Increasing / Declining Flows	Commodity	Net Change in Tonnage	Compound Annual Growth Rate
Five Most Increasing Commodity Flows 2011-2031	Electrical Machinery, Equipment or Supplies	23,550	4.9%
	Containers, Carriers or Devices, Shipping, Returned Empty	29,969	3.8%
	Chemicals or Allied Products	538,892	3.8%
	Fabricated Metal Products	16,214	3.6%
	Transportation Equipment	3,348,605	3.6%
Five Most Decreasing Commodity Flows 2011-2031	Textile Mill Products	(13,094)	-2.6%
	Apparel or Other Finished Textile Products	(3,597)	-2.4%
	Furniture or Fixtures	(416)	-1.7%
	Lumber or Wood Products, excluding Furniture	(29,052)	-0.6%
	Pulp, Paper or Allied Products	(2,498)	-0.4%
Other Flows	*All Other Commodities*	*4,676,485*	*1.4%*
Total Forecast Change	**All Commodities**	**8,585,060**	**1.9%**

Source: 2006 and 2009 Waybill and EDR estimates extrapolated using IMPLAN data and Moody's forecasts

The rail forecast also points to specific trading partners with whom Missouri is expected to increase its overall trade between 2011 and 2031. **Table 9** and **Table 10** indicate the five rail trading partners with which Missouri is expected to experience the greatest change in its imports and exports (respectively) to the year 2031.

The forecast anticipates increases in rail imports to Missouri from New Jersey, Washington State, the Indiana portion of the Chicago metropolitan area, Virginia and San Francisco and

decreases in rail tonnage imported from Sacramento; Cleveland; Memphis; and British Columbia, Canada. For outbound rail, the fastest growing trade partners are expected to be Virginia, Montana, the Indiana portion of the Chicago metropolitan area, Ohio and San Francisco. Trading partners where the forecast points to declining outbound rail markets from Missouri include South Carolina; Cincinnati; Maine; Alberta, Canada; and Wisconsin.

Table 9: Imports to Missouri by Origin (2011-2031) - Domestic and International Combined

Top Increasing / Declining Flows	Origin	Net Change in Tonnage	Compound Annual Growth Rate
Five Most Increasing Commodity Flows 2011-2031	New Jersey	2,337,779	13.3%
	Washington State	2,520,610	11.5%
	Indiana Portion of Chicago Metro Area	513,203	10.7%
	Virginia	92,877	10.1%
	San Francisco, CA	1,042,988	9.7%
Five Most Decreasing Commodity Flows 2011-2031	Sacramento, CA	(1,733)	-3.6%
	Memphis, TN	(10,747)	-1.4%
	Cleveland, OH	(383)	-0.3%
	British Columbia	(6,889)	-0.1%
Other Flows	*All Other Locations*	*19,840,434*	*1.4%*
Total Forecast Change	**All Locations**	**26,328,139**	**1.70%**

Source: 2006 and 2009 Waybill and EDR estimates extrapolated using IMPLAN data and Moody's forecasts

Table 10: Exports from Missouri by Destination (2011-2031) - Domestic and International Combined

Top Increasing / Declining Flows	Destination	Net Change in Tonnage	Compound Ann. Growth Rate
Five Most Increasing Commodity Flows 2011-2031	Virginia	188,641	5.6%
	Montana	24,921	4.4%
	Indiana Portion of Chicago Metro Area	26,859	4.0%
	Ohio (Outside of Metro Areas)	54,004	3.6%
	San Francisco, CA	454,180	3.3%
Five Most Decreasing Commodity Flows 2011-2031	South Carolina	(4,090)	-0.8%
	Cincinnati, OH	(299)	-0.4%
	Maine	(1,339)	-0.4%
	Alberta	(677)	-0.3%
	Wisconsin	(2,886)	-0.2%
Other Flows	*All Other Commodities*	*7,845,745*	*1.8%*
Total Forecast Change	**All Locations**	**8,585,060**	**1.9%**

Source: 2006 and 2009 Waybill and EDR estimates extrapolated using IMPLAN data and Moody's forecasts

Table 11: Employment Trend and Forecast for Missouri Industries

Industry Sector	2001 Employment	2011 Employment (Estimated)	2001-2011 Growth Rate (Compound Annual)	2031 Employment (Estimated)	Projected Growth Rate (Compound Annual)
Growth Sectors					
Waste Mgmt. Services	5,359	4,352	-2.1%	8,494	3.4%
Support Activities-Mining	58	252	15.9%	473	3.2%
Other Information Services	706	927	2.8%	1,674	3.0%
Motion Picture and Recording	4,046	3,488	-1.5%	5,715	2.5%
Wholesale Electronic Markets	17,984	25,566	3.6%	39,508	2.2%
Admin. and Support Services	123,741	136,619	1.0%	203,009	2.0%
Heavy and Civil Eng. Construction	17,879	13,265	-2.9%	19,328	1.9%
Broadcasting	6,405	5,965	-0.7%	8,522	1.8%
Oil and Gas Extraction	15	27	5.8%	39	1.8%
Social Assistance	44,463	57,476	2.6%	80,520	1.7%
Ambulatory Health Care Services	82,924	105,832	2.5%	148,264	1.7%
Specialty Trade Contractors	90,336	72,530	-2.2%	93,909	1.3%
Food Services and Drinking Places	183,006	203,223	1.1%	257,978	1.2%
Data Processing Services	9,230	9,279	0.1%	11,779	1.2%
Publishing Industries	21,547	14,404	-4.0%	17,927	1.1%
Other Sectors					
Pipeline Transportation	221	271	2.1%	226	-0.9%
Transportation Equip Manufacturing	57,968	34,438	-5.1%	28,167	-1.0%
Textile Mills	487	324	-4.0%	260	-1.1%
Truck Transportation	42,359	36,217	-1.6%	29,029	-1.1%
Textile Product Mills	3,049	2,505	-2.0%	1,968	-1.2%
Couriers & Messengers	9,010	7,824	-1.4%	6,022	-1.3%
Primary Metal Manufacturing	11,341	6,669	-5.2%	5,133	-1.3%
Rental & Lease Services	12,827	10,533	-2.0%	7,945	-1.4%
Air Transportation	10,456	3,604	-10.1%	2,406	-2.0%
Apparel Manufacturing	4,979	2,399	-7.0%	1,388	-2.7%
All Other Industries	1,540,922	1,452,997	-0.6%	1,573,762	0.4%
All Industries	**2,301,318**	**2,210,987**	**-0.4%**	**2,592,966**	**0.8%**

Source: Interpolation from Moody's forecasts 2011

The import and export tonnage forecasts and growth rates in **Tables 9 and 10** anticipate changes in national and state-level economic factors significantly affecting Missouri's outlook by 2031. Underlying shift's in Missouri's economic base is likely to have impacts on the role of the rail system for both imports and exports to and from Missouri to 2031 and beyond. **Table 11** above shows the forecast for Missouri's industry sectors to the year 2031 which serve as the basis for the forecasts of rail activity and identifies high growth sectors.

4.0 Evaluation of Missouri's Rail Capacity

The state of Missouri has had a longstanding involvement in passenger rail service, most notably by providing operating funding for the Missouri River Runner service between St. Louis and Kansas City. The intercity passenger rail services in the state are seeing a significant rise in ridership and revenue. While on-time performance for the Missouri River Runner has improved significantly over the past five years, there are still major capacity bottlenecks along the route, particularly in sections of the corridor west of Jefferson City which have only one track.

With these challenging demands the state faces some difficult issues. The freight railroads are focused on long-haul, high-volume services from their business point of view, but industrial, mining, and agricultural shippers in the state need short-haul and low-volume rail services to provide a lower cost alternative to the more expensive truck mode. As the demand for rail service in the state has begun to transcend the available capacity, there is increasing public interest in gaining a better understanding of where capacity bottlenecks and constraints may exist both now and in the future.

The evaluation of Missouri's rail capacity was initiated to:

- Investigate major rail corridors to determine capacity for both freight and passenger service
- Identify current and anticipated institutional, operational, and capacity constraints
- Analyze the impact of the anticipated increases in freight and passenger train traffic on the identified congestion points

4.1 Existing Capacity Generation Methodology

This section describes the methodology used to determine the estimated current and future railroad capacity. The methodology was adapted from the *National Rail Freight Infrastructure Capacity and Investment Study*[13] prepared for the AAR. The basis for determining the level of congestion on a rail corridor is a calculated volume-to-capacity ratio. Since, this is a high level statewide planning study, the methodology for examining national capacity needs presented in the *National Rail Freight Infrastructure Capacity and Investment Study* was felt to provide the best approach. Three factors - number of tracks, train control system, and train type are used to determine the current capacity, consistent with the AAR methodology. The results of this planning level analysis can be used to identify locations where more detailed operations models can be applied to identify specific infrastructure or operational improvements. These models typically incorporate and analyze a large number of factors such as number of tracks, horizontal and vertical track geometry, siding length and switch type, track speed, locomotive type and terrain.

4.1.1 Tracks

Most of the railroad lines in Missouri are single tracked with multiple sidings along the lines for trains to pass each other. A limited number of lines or line segments have multiple tracks to provide additional capacity and ease congestion.

[13] *National Rail Freight Infrastructure Capacity and Investment Study,* Cambridge Systematics, Inc. for Association of American Railroads. September 2007.

4.1.2 Train Types

Train type data is essential in determining the speed of the train and the spacing of trains on the track to avoid congestion and delay. Different trains operate at different speeds due to various factors affecting the system such as terrain, track curvature, locomotive type, and braking capabilities. Operation of a single train type increases capacity of a line due to uniform speed, length, and braking characteristics when compared to multiple train types, which reduces the capacity due to different characteristics of each train type. For this study, multiple train types, which includes a mix of merchandise, intermodal, passenger, and coal, has been assumed to be running on each line.

4.1.3 Train Control Systems

The train control system plays an important role in determining the system characteristics and affects the system capacity. The control system is used to maintain safe spacing between trains during meeting and passing on the same track. There are three major types of train control systems:[14]

- **Automatic Block Signaling (ABS) –** is a train control system which determines when a train can advance to the next block of tracks. A block is defined as a segment of track with traffic control signals at each end. The length of the track segment is dependent on the length of the train and the distance required stopping the train safely. A railroad dispatcher cannot control an ABS control system remotely.
- **Centralized Traffic Control (CTC) and Traffic Control System (TCS) –** are train control systems, which utilize electrical circuits embedded in the tracks to monitor the location of the train. CTC and TCS increase capacity and automatically prevent trains from entering track segments already occupied by other trains thereby maintaining a safe operational condition. CTC and TCS can be controlled from a remote location, which is generally a central dispatching office.
- **No Signal (N/S) and Track Warrant Control (TWC) –** are very basic train control systems which require the train crew to obtain warrants or permission to enter the track segment. These are typically used on low volume tracks instead of using expensive ABS or CTC/TCS train control systems.

There are eight combinations of number of tracks and train control systems commonly used across the primary corridors in the U.S. **Table 12** shows these combinations and also provides a practical maximum train count of both multiple train types and single train types which can be run on these corridors. A typical corridor with two main tracks governed by ABS can handle up to 53 trains per day, which is a mix of intermodal, coal, mix merchandise/ bulk trains, and passenger trains. The same corridor, if serving a single train type like intermodal trains, can operate at a capacity of about 80 trains per day.

Typically in Missouri, the rail corridors consists of one or two main tracks with sidings to meet and pass on the same track, and are governed by TWC, ABS, or CTC or TCS train control

[14] *National Rail Freight Infrastructure Capacity and Investment Study* by Cambridge Systematics, Inc. for Association of American Railroads. September 2007

systems. For this study, practical maximum if multiple train types use corridor numbers are considered to be consistent with the assumption made on the train type.

Table 12: Average Capacity of Freight Rail Corridors (Trains per Day)

Number of Tracks	Type of Control System	Trains per Day	
		Practical Maximum if Multiple Train Types Use Corridor	Practical Maximum if Single Train Type Uses Corridor
1	N/S or TWC	16	20
1	ABS	18	25
2	N/S or TWC	28	35
1	CTC or TCS	30	48
2	ABS	53	80
2	CTC or TCS	75	100
3	CTC or TCS	133	163
4	CTC or TCS	173	230
5	CTC or TCS	248	340
6	CTC or TCS	360	415

Source: National Rail Freight Infrastructure Capacity and Investment Study, AAR, 2007.

Each corridor in the Missouri rail system was assigned a capacity based on the train type, train control system, and number of main tracks. Current corridor volumes were compared to the corridor capacity from **Table 12** and the Level of Service (LOS) grade was determined by calculating the volume to capacity ratio for each corridor. The LOS grades are shown in **Table 13**.

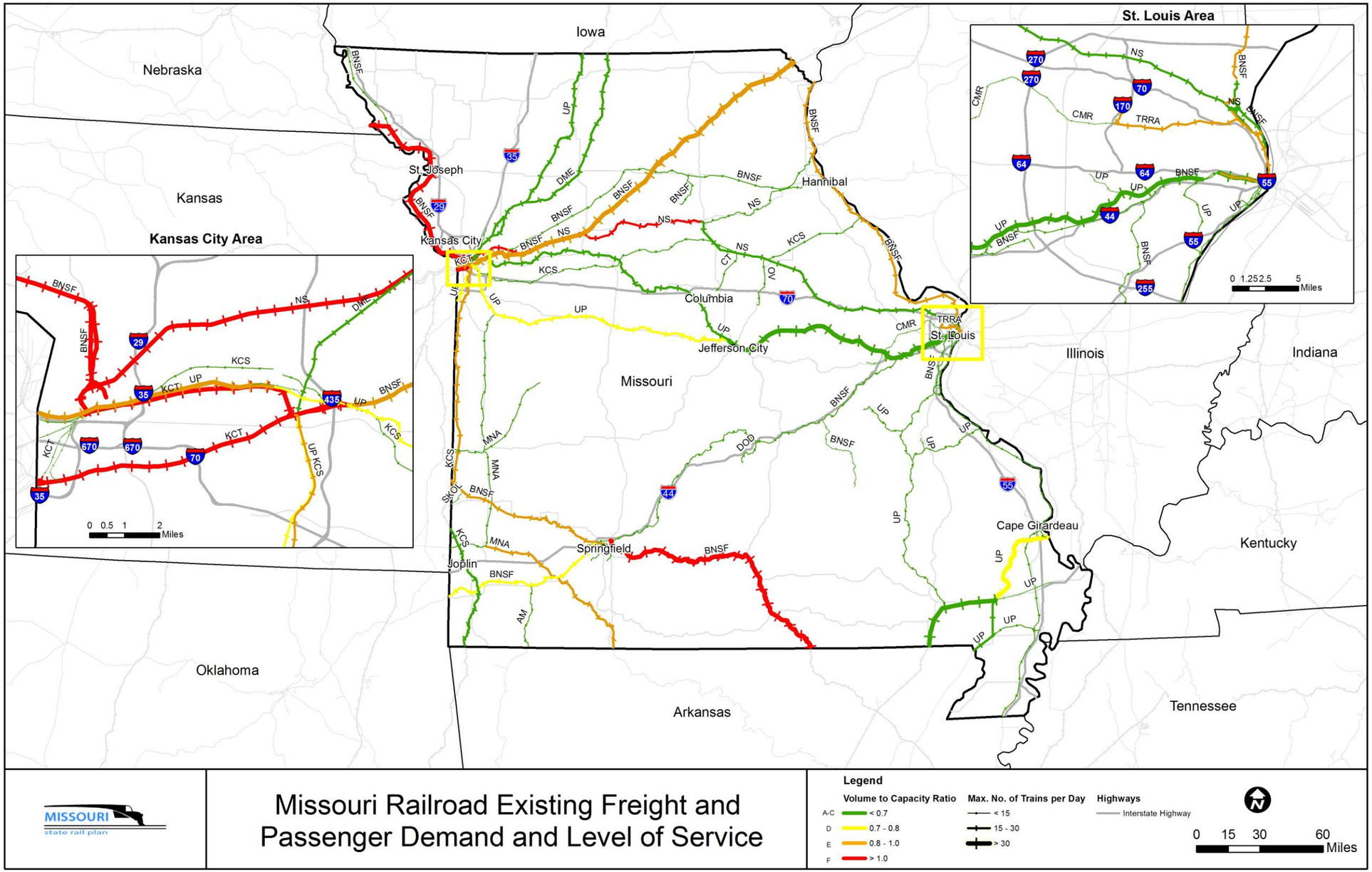
Table 13: Volume to Capacity Ratio and Level of Service Grades

	LOS Grade	Capacity Level	Description	Volume/Capacity Ratio
	A B C	Below Capacity	Low to moderate train flows with capacity to accommodate maintenance and recover from incidents	0.0 to 0.2 0.2 to 0.4 0.4 to 0.7
	D	Near Capacity	Heavy train flow with moderate capacity to accommodate maintenance and recover from incidents	0.7 to 0.8
	E	At Capacity	Very heavy train flow with very limited capacity to accommodate maintenance and recover from incidents	0.8 to 1.0
	F	Above Capacity	Unstable flows; service breakdown conditions	> 1.0

A rail corridor operating at a volume to capacity ratio of 0.7 is operating at 70 percent of its theoretical maximum capacity. In some cases this is considered to be the practical capacity of the corridor because a portion of the theoretical maximum capacity is lost to maintenance, weather delays, equipment failures, and other factors.

Figure 4 shows the LOS and demand, which is expressed as number of trains per day for Missouri. The majority of Class I rail corridors are at capacity (orange) or have exceeded capacity (red) in Missouri, with demand in excess of 30 trains per day. On the contrary, Class II and Regional railroads in Missouri show below or near capacity with demand less than 15 trains per day.

Figure 4: Existing Freight and Passenger Demand and Level of Service



4.2 Future Capacity Generation Methodology

The methodology to determine the future capacity of rail corridors is described in this section. Once the existing conditions are established for the rail corridors, estimating future capacity involves studying commodity growth and their distribution path. To estimate the future capacity it is necessary to establish the commodity growth for 2031 and determine its flow pattern in the state of Missouri. This task is accomplished by analyzing the economic forecast data for this plan (see Section 8.0).

The economic forecast data provides information on commodity flows between origin-destination (O-D) pairs, 2011 commodity tonnage flow between the O-D pairs, 2031 commodity tonnage flows between the O-D pairs, all the railroads who ship the product between the O-D pairs and the rail subdivisions these commodities traverse through to reach the destination. Once the O-D pairs for Missouri are established, the commodities are assigned to rail corridors by analyzing the railroad operators in a particular subdivision.

Commodity growth rate is calculated using existing (2011) and forecasted (2031) commodity data. This procedure is followed for all the commodities shipped between the given O-D pair and an average growth rate is determined. The estimated average growth rate is assumed to be the constant annual growth rate for a given corridor.

MoDOT maintains an extensive rail inventory database, which is updated annually with current data provided by railroads. The 2011 tonnage value for each corridor is then forecasted using the growth rate calculated. The practical capacity of the rail corridor is assumed to be constant (i.e. no infrastructure improvements are made to the existing corridors until 2031) and is calculated using the AAR methodology as described in existing conditions methodology. Once the 2031 gross tonnage values are established, the number of trains per day is determined. The gross tonnage value for each rail car is assumed to be 60 tons, and the number of rail cars in a train is approximated to 90 per train based on empirical observations. The number of trains per day in 2031 is used to determine the LOS of a corridor calculated as volume to capacity ratio.

Based on the methodology described, the future capacity numbers were generated and illustrated in **Figure 5**. In the future capacity generation, the infrastructure characteristics are assumed to be the same as the existing condition with no improvements to the number of tracks, the train control system, and improvement in technology or locomotives. Most of the corridors project a positive growth in freight movement with increased LOS and demand. Corridors which changed from a LOS A through D to a LOS E or F are highlighted in **Figure 6**.

Figure 5: 2031 Freight and Passenger Demand and Level of Service

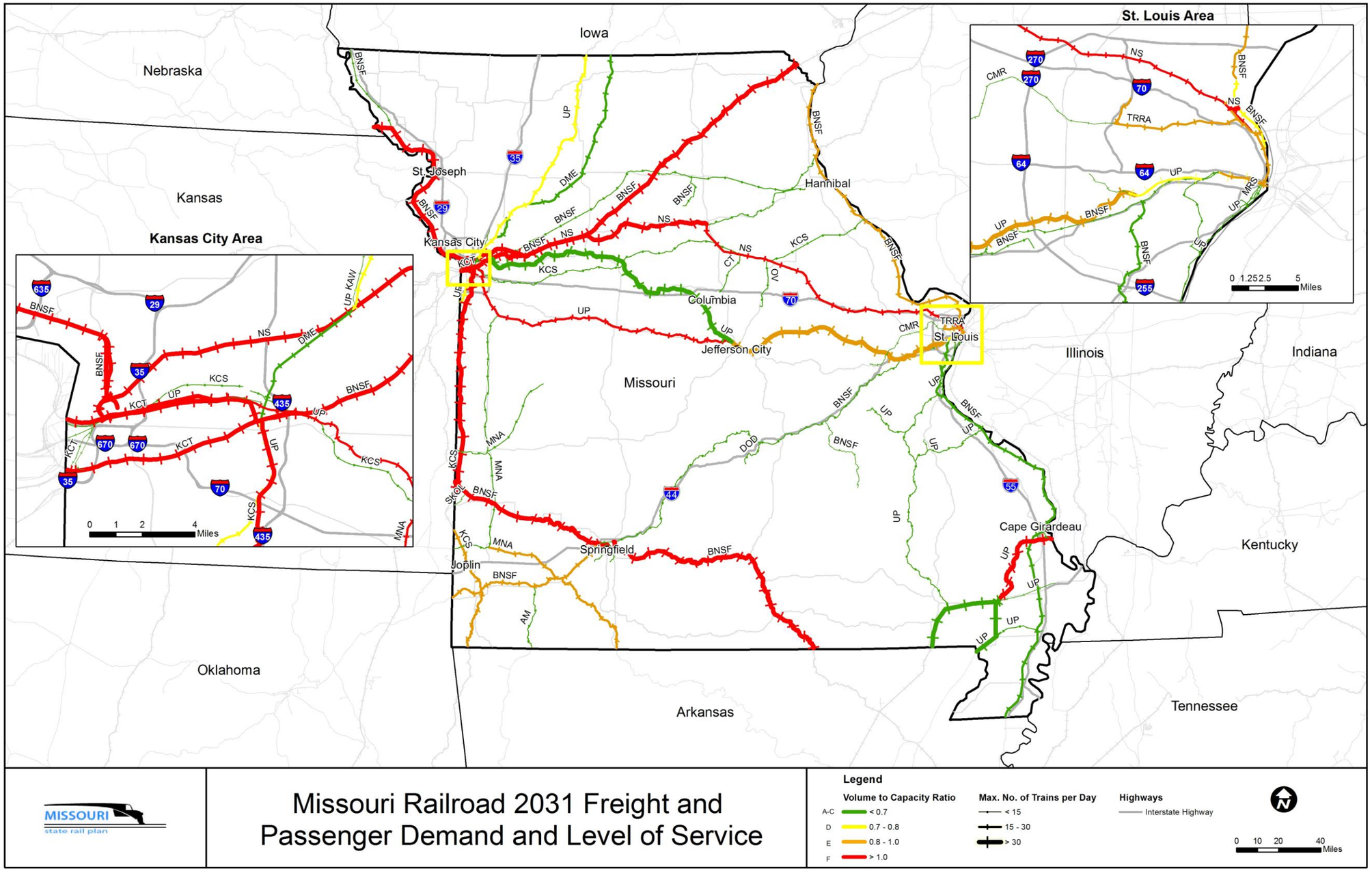
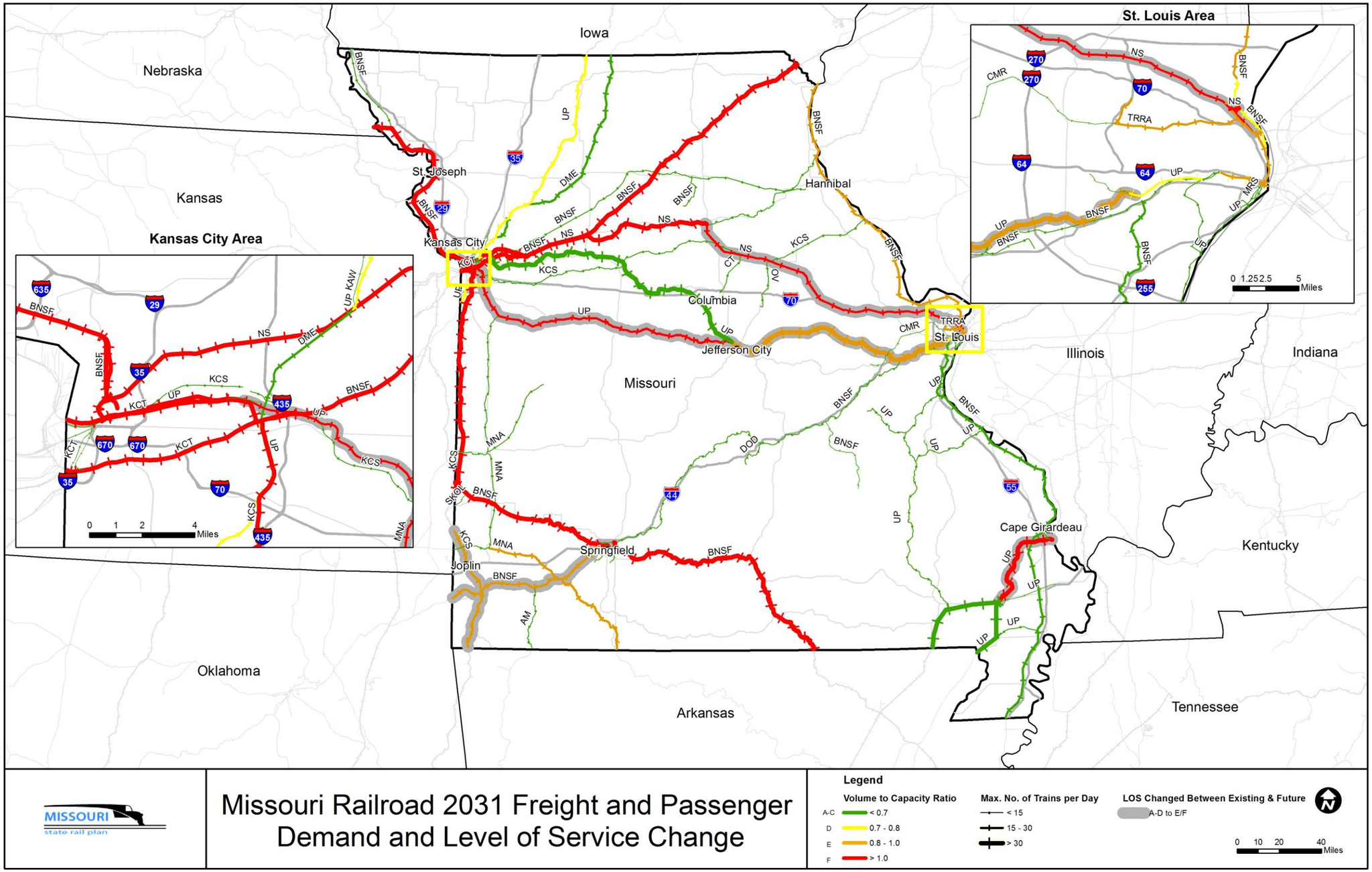


Figure 6: 2031 Freight and Passenger Demand and Level of Service Change



5.0 Previous Plans and Studies

In order to help Missouri maximize the current and potential economic benefits of the state's rail system, it is important to understand all the plans and studies previously undertaken.

The Existing Conditions Report was prepared for MoDOT with the objective of setting the rail system's existing conditions as a baseline condition against which Missouri can compare the effects of current and future potential improvements. To meet this objective, the report explores and summarizes: 1) previous statewide plans and programs, 2) regional plans and studies and 3) multi-state and national plans and studies. This section of the report summarizes those studies and identifies key lessons learned. **Table 14** lists the previous studies summarized in this report.

Table 14: Previous Rail Plans and Studies

Statewide Plans and Programs
1. Statewide Transportation Improvement Program FY 2012-2016 (STIP)
2. Tracker (2011)
3. Missouri Freight and Passenger Rail Analysis Phase 2 (2009)
4. Impact of Public Policy on Rail Development in Missouri (2009)
5. Multimodal Operations Railroad Section (2007)
6. Missouri Freight Transportation, Rail Freight (2008)
7. Missouri Freight and Passenger Rail Capacity Analysis Phase 1 (2007)
8. Report on Proposed Operation of Passenger Train Service Between St. Louis and Southwest Missouri (2007)
9. Capacity of Missouri Railroads (2007)
10. Missouri's Long-Range Transportation Plan (2007)
11. Missouri Statewide Freight Study (2005)
12. Applications Submitted by MoDOT to FRA to Secure Additional Stimulus Funding (2011)
Regional Plans and Studies
1. Regional Transportation Plan 2040 (2011)
2. Regional Transit Implementation Plan – Commuter Corridors (2010)
3. Northside Southside Study – Planning Transit Improvements for St. Louis City (2008)
4. Kansas City Region Commuter Rail Study – Implementation Strategy (2002)
5. Kansas City Region Commuter Rail Study – Detailed Assessment of Feasible Corridors (2001)
6. Kansas City Regional Commuter Rail Study – Initial Corridor Screening Part 1 & Part 2

Multi-State, National and Federal Plans and Studies
1. Feasibility Report of Proposed Amtrak Service (Kansas City – Oklahoma City – Fort Worth) (2010)
2. Chicago to St. Louis 220 mph High Speed Rail Alternative Corridor Study – Volume 1 (2009)
3. Chicago to St. Louis 220 mph High Speed Rail Alternative Corridor Study – Volume 2 (2009)
4. Midwest Regional Rail System (2004)
5. Final Metrics and Standard for Intercity Passenger Rail Service (2010)
6. Preliminary National Rail Plan (2009)
7. Vision for High Speed Rail in America (2009)
8. Financing Freight Improvements (2007)
9. Vision for the Future – U.S. Intercity Passenger Rail Network Through 2050 (2007)
10. Railroad Corridor Transportation Plans: A Guidance Manual (2005)
Federal and State Regulations
1. Federal Railroad Regulations Chapter II and Chapter III of the Title 49 CFR Parts 200 to 399 (2000s)
2. Missouri Revised Statutes, Chapter 622, Division of Motor Carrier and Railroad Safety (2010)
3. Missouri Revised Statutes, Chapter 680, Transportation Services (2010)
4. Missouri Revised Statutes, Chapter 389, and Regulation of Railroad Corporations (2010)
5. Code of State Regulations, State Railroad Regulations (2010)

5.1 Statewide Plans and Programs

MoDOT, in accordance with state and federal law, prepared the *Statewide Transportation Improvement Program (STIP)*, for state fiscal years 2012 through 2016 (July 1, 2011 through June 30, 2016.) The STIP provides a projection of the budget for MoDOT's Rail Program for each of the five years covered in the program.

MoDOT uses its *Tracker* tool for measuring and reporting its performance in delivering goods and services to its customers. Measures directly related to Missouri's rail system and operations are a safe transportation system, advance economic development, efficient movement of goods, and easily accessible modal choices.

The *Missouri Freight and Passenger Rail Analysis Phase 2* (2009) developed a prioritized list of rail enhancements to address current passenger and freight rail performance on the Union Pacific line between St. Louis and Kansas City in order to improve on-time passenger service and reduce freight delays. Projects simulated and identified to improve Amtrak reliability and freight flow were shown in the exhibit.

Recommendations from the *Impact of Public Policy on Rail Development in Missouri* (2009) included:

1. Asking the state legislature to make additional appropriations into the MoDOT State Transportation Assistance Revolving Fund (STAR Fund) for the purpose of railroad and other multimodal improvements, perhaps targeted at regional and short-line railroads.
2. Authorizing an investment tax credit for railroad investments related to economic development.
3. Proposing statutory exemption of all railroad equipment from state sales taxes.

Recommendations from the *Report on Proposed Operation of Passenger Train Service Between St. Louis and Southwest Missouri* (2007) were:

1. Recommended against implementing passenger rail service between Springfield and St. Louis route due to lack of competitive trip time, insignificant ridership, and high capital investment.
2. Conducting grade crossing safety study with train-activated warning devices.
3. Significant capital is required for passenger rail to run at competitive speeds.
4. The calculated travel time between Springfield and St. Louis is approximately six hours primarily due to curvature on the route.
5. Capital will be required to construct platforms, shelters and station buildings.

Applications submitted by MoDOT to FRA to secure additional stimulus funding (2011) included the following projects:

1. New Rail Cars (Approved)
2. Bonnots Mill Crossover (Approved)
3. Knob Noster Siding (Approved)
4. St. Louis Terminal Merchant's Bridge 12 (West Approach Approved)
5. Kansas City Terminal – Independence St. Bridge Replacement
6. St. Louis Terminal – Market to Biddle (Approved)
7. Herrmann Crossover (Approved)
8. Jefferson City 3rd Mainline
9. Lee's Summit to Pleasant Hill (Approved)
10. Strasburg Grade Separation (Approved)
11. Jefferson City Station
12. Pleasant Hill to Jefferson City
13. Kingsville Passing Siding (Approved)
14. New High Speed Corridor

5.2 Regional Plans and Studies

Regional long range planning documents have been developed in both St. Louis and Kansas City which identify the importance of rail infrastructure to their overall transportation systems. In addition to freight rail investment in St. Louis and Kansas City, both communities are currently performing feasibility studies for passenger commuter rail. This local passenger rail service is in addition to the existing St. Louis light rail system.

5.3 Multi-State and National Plans and Studies

In 2009, the Midwest High Speed Rail Association (MHSRA) conducted a limited alternative corridor feasibility study for a high-speed passenger rail route from Chicago to St. Louis via Kankakee, Champaign, Decatur, and Springfield. The objective of the *Chicago to St. Louis 220 mph High Speed Rail Alternative Corridor Study* was to:

1. Conduct a sketch planning exercise to develop a ridership estimate sufficient to complete an initial calculation of project benefits and train fleet requirements needed to meet the estimated demand.
2. Prepare an economic benefit analysis showing the economic impact of the proposed project.
3. Prepare an environmental benefit analysis describing the general impacts of the proposed project on the environment along the corridor.

The Midwest Regional Rail Initiative (MWRRI) is a cooperative, multi-agency effort which began in 1996, involving nine Midwest states (Indiana, Illinois, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin), as well as the Federal Railroad Administration. This collaboration forges an enhanced partnership between U.S. DOT, FRA and the Midwestern states for planning and providing passenger rail service. In 2004, MWRRI published their recommendations for *The Midwest Regional Rail System* (MWRRS). Key elements of the plan for Missouri include:

1. Increase the number of daily round trips between St. Louis and Kansas City from two to six when MWRRS is fully implemented.
2. Implement feeder bus services to extend the reach of the system to outlying areas.
3. The MWRRS operating plan proposes a maximum speed of 90 mph and a time reduction of 1 hour and 26 minutes when fully implemented.
4. MWRRI capital investment for the corridor is approximately $890 million based on 2002 numbers.
5. MWRRS system recommends infrastructure improvements such as train control system, highway-railroad grade crossings and passenger stations.

In 2010, FRA published the *Final Metrics and Standards for Intercity Passenger Rail Service.* This was part of PRIIA, which charged FRA and Amtrak jointly and in consultation with other parties, with developing new or improving existing metrics and minimum standards for measuring the performance and service quality of intercity passenger train operations. The metrics are based on the following national rail goals:

1. Continue development of a vision for high-speed intercity passenger rail
2. Improve safety
3. Improve fuel efficiency
4. Foster livable communities
5. Increase the economic competitiveness of the United States
6. Better understand and integrate the unique economics of the rail industry
7. Help bolster the domestic passenger rail industry and create jobs

PRIIA also directs the FRA to develop a National Rail Plan to establish a national policy and vision for the development of passenger rail services. An important step in developing the long-range National Rail Plan is developing state rail plans to set policies for freight and passenger rail transportation, establish priorities and implementation strategies to enhance rail service in the public interest, and serve as the basis for federal and state rail investments. State rail plans should use the national plan as a framework for future development. At the same time, the national plan must take into account previous actions and goals developed in the state plans.

6.0 Funding and Organizational Opportunities

6.1 State Legislation and Funding Supporting Passenger Rail Projects

MoDOT is responsible for administering and implementing transportation projects and programs within the state. The department operates under a decentralized organization with its principle office in Jefferson City. This central office provides staff assistance and functional control for the various departmental tasks in seven geographical districts.

MoDOT is governed by the Missouri Highways and Transportation Commission, which is a six-member, bi-partisan board appointed by the governor and confirmed by the Missouri Senate. MoDOT's director and secretary to the commission are appointed by the commission. The director is responsible for all other employee appointments and hiring.

MoDOT is responsible for maintaining Missouri's 33,845 mile highway system and 10,405 bridges, as well as improving waterways, transit, aviation, railroads, freight development and bicycle and pedestrian travel. The various non-highway modes are established as sections within the Central Office and report to the Director of Multimodal Operations, who reports to the Deputy Chief Engineer. These sections carry out the statewide planning for these modes; there are no counterparts in the districts.

The MoDOT Multimodal Operations Division is the administrative division responsible for supporting alternative transportation programs within the state. The division functions to continue the advancement and strategic planning for Aviation, Rail, Transit, Waterways, and Freight Development initiatives designed to expand Missouri's infrastructure and facilitate travel and commerce. Through the integration of the various modes, the traveling public enjoys greater accessibility to the resources of the state while industry capitalizes on improved transportation efficiencies.

In 2004, Missouri voters approved Constitutional Amendment 3 which requires all revenues from the existing state motor vehicle fuel tax (less collection costs and costs to administer and enforce state motor vehicle laws and traffic regulations) to be used only to construct, improve and maintain state highways, roads and bridges. The amendment also requires motor vehicle taxes and fees paid by highway users be used only for constructing, improving and maintaining the state highway system. The amendment prohibits these motor vehicle taxes dedicated for state highway purposes from funding the other, non-highway modes of transportation. However, the amendment also provided that 2 percent of the first one-half of the motor vehicle sales tax be deposited into the State Transportation Fund, which is required to be used solely to fund aviation, mass transportation, transportation of elderly and handicapped, railroads, ports, waterborne commerce and intermodal connections.

6.1.1 Rail Program Activities – Missouri DOT Railroad Section

The Railroad Section of MoDOT's Multimodal Operations Division administers the state's railroad program. This program includes freight rail regulation, intercity passenger rail improvement and promotion, light rail safety regulation, highway-rail crossing safety, and rail/highway construction. The section conducts railroad safety inspections of railroad infrastructure as it relates to track, grade crossing signals, and railroad operating practices.

Unlike many states, Missouri does not own or operate any freight railroad right of way and does not provide funding to support short line railroad operations in the state.

The Railroad Section's intercity passenger rail activities include planning, coordinating and providing operating funding for Amtrak services in Missouri and managing federal capital grants for passenger rail infrastructure improvements. Missouri does not have a dedicated source of funding for either Amtrak operating support or passenger rail capital improvements, including matching funds for federal grants.

This section currently has 11 full time employees whose work centers on freight railroad regulation, railroad safety and highway-rail grade crossing activities. Less than one full time employee is currently available for intercity passenger rail program support activities.

A major responsibility of the MoDOT Railroad Section is railroad safety. MoDOT is mandated by the Missouri Revised Statutes with the responsibility of providing safety oversight of railroad operations within the state. The statutes contained in Chapters 286, 388, 389 and 622 obligate the state of Missouri to promote and safeguard the health and welfare of the general public, the railroads, and the railroad employees. The statutes grant MoDOT the authority to promulgate rules enforceable by the Railroad Section and applicable to all railroads and companies which are part of the general railroad system and any light rail system in Missouri. The Railroad Section exercises its oversight responsibility through the enforcement of state laws and rules and through a cooperative agreement with the U.S. Department of Transportation's Federal Railroad Administration (FRA), Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) to enforce federal laws and regulations. The Railroad Section is designated with the task of implementing MoDOT's safety oversight on railroads and light rail systems. The major railroad safety areas handled by the Railroad Section include:

- Grade crossing installation and upgrades
- Track safety
- Grade crossing signal inspection
- Grade crossing safety
- Employee safety
- Railroad operating practices

Railroad safety inspections and other related regulatory activities conducted by the MoDOT Railroad Section are funded in part by annual assessments of railroad companies operating in Missouri based on their gross intrastate operating revenues. For large railroads, up to 3 percent of gross intrastate operating revenues can be assessed per Section 622.300 of the Missouri Revised Statutes. Any railroad with less than 50 route miles of track within Missouri can be assessed no less than $100, nor more than $500 per year. Those railroads with between 50 and 100 route miles of track can be assessed no less than $1,000 per year. If a railroad has more than 100 route miles of track, they can be assessed no less than $5,000 per year. These program revenue payments are deposited in a railroad expense fund devoted solely to the payment of expenditures incurred by the MoDOT Multimodal Operations Division for the regulation of these companies. If there are funds left over from previous year's assessments, they are applied by appropriation to cover these expenditures in succeeding fiscal years. If this

happens, the amount assessed to railroads the next year is reduced accordingly. Railroad contributions over the past five years are shown below in **Table 15.**

Table 15: MoDOT Rail Program Revenue Contributions from Missouri Railroads

State Fiscal Year (July 1 – June 30)	Railroad Contribution
2007	$758,939
2008	$753,909
2009	$751,582
2010	$833,289
2011	$665,799

6.1.2 Highway-Rail Crossing Safety Program

The MoDOT Railroad Section annually programs approximately $5.9 million in FHWA Surface Transportation Program Safety Funds (Section 130), and approximately $1.2 million in state funds from the state Grade Crossing Safety Account (GCSA) available to address safety issues at these crossings. The $5.9 million in federal Section 130 funding has been constant since 2005 and represents approximately one-half of the 10 percent of federal Surface Transportation Program Funds, which must be spent on safety projects. The state GCSA is funded from state motor vehicle licensing fees. Under the provisions of Section 389.612 of the Missouri Revised Statutes, each motor vehicle registration or renewal is assessed 25 cents for this purpose.

There are approximately 3,800 public highway-rail crossings and 2,000 private highway-rail crossings in Missouri. Funds from the federal Section 130 program and the state GCSA can only be used for public crossings. MoDOT evaluates and ranks these crossings annually according to a hazard exposure index which considers such items as train traffic and speed, vehicle traffic and speed, crossing accident history and sight distance. On projects identified through the exposure index, the Missouri Highways and Transportation Commission normally funds 80 percent of each project using federal funds and the remaining 20 percent through the GCSA.

In order to extend limited state funding, MoDOT requires a 20 percent local match to the state and federal funds on other types of crossing improvements such as quiet zones and sight distance clearing projects. On the average, it costs $200,000 - $250,000 per crossing for highway-rail safety improvements, resulting in updates to approximately 30 to 35 crossings per year. Project improvements typically include the installation of railroad crossing signal devices, and may vary in scope and completion dates depending on funding availability and programming restrictions each fiscal year. A project may also last for one or more fiscal years due to funding restrictions and other unanticipated events. A fluid list of projects can be found in the FY 2012-2016 Statewide Transportation Improvement Plan and subsequent versions.

6.1.3 State Support for Passenger Rail Service

MoDOT provides funding to Amtrak for the Missouri River Runner passenger rail service between St. Louis and Kansas City. Two round-trips per day are currently supported, with intermediate stops in Kirkwood, Washington, Hermann, Jefferson City, Sedalia, Warrensburg,

Lee's Summit and Independence. In FY 2011, service was provided to approximately 191,000 passengers. There is not a dedicated funding source for passenger rail. Passenger rail funding is subject to a legislative general revenue appropriation each year under the provisions of Article IV, Section 3(c) of the Missouri Constitution and Section 33.543 of the Missouri Revised Statutes. State contributions to the Missouri River Runner service have increased over the past five years from $6.6 million in FY 2007 to $8.1 million in FY 2011 and are shown in **Table 16** below. Provisions of Section 209 of PRIIA passed by Congress in 2008 require Amtrak to establish a more equitable cost-sharing system. This may provide additional stability in future Amtrak state funding requests.

Table 16: Annual State Operating Support for Amtrak Missouri River Runner Service

State Fiscal Year (July 1 – June 30)	Amtrak State Cost
2007	$6,600,000
2008	$7,400,000
2009	$8,000,000
2010	$7,875,000
2011	$8,100,000
2007 – 2011 Total	**$37,975,000**

6.1.4 Station Improvements Program

The MoDOT Railroad Section manages a small grant program which provides $25,000 annually for improvements at existing Amtrak stations. Grantees are typically local communities and/or non-profits which own and maintain stations. Grants are provided for maintenance and repair projects and related operational and safety improvements. This funding is appropriated under Article IV, Section 30(c), of the Missouri Constitution and Section 226.225 of the Missouri Revised Statutes.

6.1.5 State Transportation Assistance Revolving Fund (STAR)

The State Transportation Assistance Revolving Fund (STAR Fund) can provide loans on favorable terms for the planning, acquisition, development and construction of passenger and freight rail facilities and the purchase of rolling stock for transit purposes. The program was established in 1996 by Senate Bill 780, with an initial appropriation of $2.5 million in 1997. Provisions are contained in Section 226.191 of the Missouri Revised Statutes. The Missouri Highways and Transportation Commission administers the fund, which assists political subdivisions or not-for-profit organizations in the development of non-highway related transportation facilities. This includes aviation, rail, water, freight or mass transit facilities. Funds cannot be used for operating expenses or for the construction or maintenance of state highways. The following are the specific eligibility requirements:

- The planning, acquisition, development and construction of facilities for transportation by air, water, rail, freight or mass transit;

- The purchase of vehicles for the transportation of elderly or handicapped persons; or
- The purchase of rolling stock for transit purposes.

Loans have ranged from $84,000 to $1,000,000 with interest rates ranging from 2.57 percent to 3.61 percent. The loan term is typically no more than 10 years. The STAR Fund has disbursed approximately $3 million in loans over the past five years. Currently the fund has approximately $982,000 available to loan. Applications are received at any time; however, they are reviewed twice a year on March 1 and September 1. Loans are awarded based on the type of project, the benefit to the public, the financial viability and the local sponsor's willingness and ability to complete the project. The STAR Fund is a revolving loan program where loan payments and any interest earned go back into the fund for additional transportation projects.

Since its inception, this program has been primarily used to help local public airports finance improvements not eligible for federal or state grant programs. This includes a number of T-hangar, terminal building and fuel facility projects. The program also assisted in financing a multimodal facility in St. Louis to bring together passenger rail, MetroLink and public transit modes.

6.1.6 The Missouri Transportation Finance Corporation (MTFC)

The Missouri Transportation Finance Corporation (MTFC) provides loans to all transportation modes (including highway projects) with the same terms as the STAR Fund. However the MTFC is a larger program and has the ability to fund larger projects than the STAR Fund. Rail projects are eligible under the MTFC Loan Program. Eligible railroad projects include:

- Right of way acquisition
- Development or establishment of new intermodal or railroad facilities
- Improvement or rehabilitation of intermodal or rail equipment or facilities (including tracks, components of tracks, bridges, yards, buildings, and shops
- Refinancing outstanding debt incurred for these purposes

The Missouri Transportation Finance Corporation recently approved a $5 million loan for five years to the Bi-State Development Agency (Metro) for the purpose of funding their debt service reserve fund.

6.2 Federal Legislation and Funding Supporting Passenger Rail Projects

There are a variety of federal programs which can be utilized to support rail improvement projects.

6.2.1 The Passenger Rail Investment and Improvement Act of 2008 (PRIIA)

PRIIA was adopted by Congress in October 2008. The act reauthorized and reformed Amtrak, and it provided a new statutory framework for a federal/state partnership to fund and develop United States high-speed and intercity passenger rail service using 80 percent federal, 20 percent state capital grants. PRIIA legislation authorized $3.4 billion in capital grants over five years to states, groups of states, interstate compacts, public agencies, and in some cases Amtrak.

This legislation requires congressional action each year to appropriate the amounts authorized. Section 301 of the act provides grants for Intercity Passenger Rail Service Capital Assistance. Section 501 provides capital grants for High-speed Rail Corridor Development for federally-designated corridors with planned speeds of 110 mph or more. Section 302 Congestion Grants are focused on relieving rail congestion bottlenecks. Section 303 requires each state to develop and maintain a state rail plan to be eligible for the funding provided in Sections 301 and 501.

6.2.2 The American Recovery and Reinvestment Act of 2009 and Transportation Investment Generating Economic Recovery (TIGER)

Congress passed the American Recovery and Reinvestment Act in February 2009. ARRA included an appropriation of $8 billion in 100 percent federal funding providing "capital assistance for high-speed rail corridors and intercity passenger rail service." This program is based on the statutory framework provided by PRIIA and focuses on funding state-sponsored projects.

ARRA also provided $1.5 billion in 100 percent flexible multi-modal funding under the Transportation Investment Generating Economic Recovery (TIGER) discretionary grant program. Since then, another $600 million in 80 percent federal funding was appropriated in 2010 for the TIGER II discretionary grant program. The TIGER grant programs provide funding for both passenger and freight rail projects.

The U.S. Department of Transportation was authorized to award another $526.9 million in TIGER Discretionary Grants pursuant to the Appropriations Act 2011 (Pub. L. 112-010, Apr. 15, 2011). This appropriation is similar, but not identical, to the appropriation for the TIGER program authorized and implemented pursuant to ARRA and the National Infrastructure Investments or TIGER II program under the FY 2010 Appropriations Act. The deadline for submission of applications was October 31, 2011.

Most recently, Congress has appropriated another $500 million in 2012 Tiger Grant Funds. In its Notice of Funding Availability (NOFA) dated January 31, 2012, FRA has made available up to $100 million of these funds for high speed and intercity passenger rail projects.

6.2.3 FRA High-Speed and Intercity Passenger Rail Program (HSIPR)

In developing guidance for ARRA grants as well as grants offered under subsequent PRIIA appropriations, a structure for the FRA's HSIPR program has evolved. The current structure is

best reflected in the most recent NOFA for FY 2010 appropriations for 80 percent federal, 20 percent state grants under three program areas:

- *Planning Grants* issued in the Federal Register on April 1, 2010
- *Service Development Program Grants* issued in the Federal Register on July 1, 2010
- *Individual Project Grants* also issued on July 1, 2010

FRA will develop final guidance and regulations for the HSIPR over the next few years, but it is likely these interim guidance documents will provide the basic framework for the PRIIA grant program as well as for future funding programs. Under the FY 2010 appropriation for these programs, $2.125 billion was provided for Service Development Program Grants, $245 million

was provided for Individual Projects, and $50 million was provided for Planning Grants. No new appropriations have been provided for HSIPR in FY 2011 or 2012.

6.2.4 FHWA Section 130 Highway-Rail Grade Crossing Program

The FHWA Section 130 Highway-Railroad Grade Crossing program provides grants for the improvement of highway-railroad grade crossings to enhance safety. This includes: separation or protection of grades at crossings, the reconstruction of existing railroad grade crossing structures, and the relocation of highways or rail lines to eliminate grade crossings. Funds from the FHWA Section 130 program can be used for freight and passenger rail projects provided the projects improve the safety of grade crossings.

The amount of federal funds available for Section 130 is dependent on annual appropriations. Federal funds for grade-crossing safety improvements are available at a 90 percent federal share, with the remaining 10 percent to be paid by state and/or local authorities and/or the railroad. The federal share may amount to 100 percent for the following projects: signing, pavement markings, active warning devices, the elimination of hazards, and crossing closures. The decision on whether to allow 100 percent federal funding rests with the individual states.

6.2.5 FRA Rail Line Relocation and Improvement Capital Grant Program

Section 9002 of SAFETEA-LU authorized $350 million per year for the purpose of providing financial assistance for local rail line and improvement projects. For FY 2010, Congress appropriated $34.5 million in federal funds for the Rail Line Relocation and Improvement Capital Grant Program. Any construction project which improves the route or structure of a rail line and 1) involves a lateral or vertical relocation of any portion of the rail line, or 2) is carried out for the purpose of mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic development, is eligible. The federal share for these funds is 90 percent, not to exceed $20 million. This program can also be useful for passenger rail projects which require the re-routing of freight operations to provide access for passenger service. No funding has been provided for this program in the 2011 appropriations process.

6.2.6 FHWA Funding Programs

While most funding programs controlled by the FHWA are targeted to roadway projects, several of the funding categories may be used for rail projects under special conditions.

- The **Surface Transportation Program (STP)** provides flexible funding which can be used for preservation of abandoned rail corridors, bridge clearance increases to accommodate double-stack intermodal trains, and freight transfer yards.
- The **Transportation Enhancement Program (TE)** provides funding which can be used for the historic preservation and/or enhancement of rail stations. Money for TE projects comes from set-aside of 10 percent of the STP.
- The **Congestion Mitigation and Air Quality Improvement Program (CMAQ)** pays for transportation projects or programs which contribute to attainment of national ambient air quality standards. CMAQ funds may be used for intercity passenger rail projects located in a nonattainment or maintenance area if they reduce emissions and meet the program's other eligibility criteria. Capital costs, as well as operating expenses (for the first three years), are eligible as long as the project contributes to attainment or maintenance of the air

quality standard through reduction in vehicle miles traveled, fuel consumption or through other factors.

- **FHWA Traffic Mitigation** project funding is available to federally-eligible highway projects to address congestion resulting from construction activities in a given highway corridor. Where cost-effective, new or enhanced intercity passenger rail service can be considered as a traffic congestion mitigation measure. Federal highway funding can then be used to support all or part of the passenger rail operating costs during the life of the construction project. The federal cost share can be either 80 percent or 90 percent with the higher figure dependent on whether the rail project is associated with mitigating congestion on an interstate highway. This funding option is most applicable to major multi-year highway improvement projects on high-volume interstate highways where intercity rail service operates in parallel to the highway corridor.

6.2.7 Federal Loan Programs

- The **Railroad Rehabilitation and Improvement Financing (RRIF)** program provides direct federal loans and loan guarantees to finance development of railroad infrastructure. Under this program, the FRA can authorize direct loans and loan guarantees to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, track components, bridges, yards, buildings and shops. It can be used to refinance outstanding debt incurred for the purposes listed above as well as for developing or establishing new intermodal or railroad facilities. While the program has been used largely for freight rail projects, it can be used for passenger rail and transit projects. In the case of passenger rail projects, RRIF funding is only workable where investment grade revenue and operating cost forecasts show the project has the potential to provide a substantial revenue stream typically after a significant public investment is made in infrastructure and/or equipment.
- The **Transportation Infrastructure Finance and Innovation Act (TIFIA),** administered by the Federal Highway Administration, authorizes credit assistance on flexible terms in the form of secured loans, loan guarantees, and standby lines of credit. TIFIA financial assistance is provided directly to public/private sponsors of surface transportation projects of national significance. The TIFIA credit program's fundamental goal is to leverage federal funds by attracting substantial private and other non-federal investment in critical improvements to the nation's surface transportation system. It can be used for both freight and passenger rail projects. A wide variety of intermodal and rail infrastructure projects are eligible and can include equipment, facilities, track, bridges, yards, buildings and shops.
- **IRS Tax Exempt Private Activity Bonds (PAB)** are federally tax-exempt bonds which can be used to finance the activities of private firms. Congress introduced private activity bonding eligibility for transportation projects through the amendment of Section 142 of the Internal Revenue Code. Mass transit projects, high speed rail facilities (over 150 mph) and freight transfer facilities are eligible for PABs. State and local governmental authorities must issue the bonds. Authorities traditionally serving as conduits for bond issuance include Development Authorities and Downtown Development Authorities, among others. An application for funding allocation is required on an annual basis and is subject to the federal cap on PABs established for each state.

- **Grant Anticipation Revenue Vehicle (GARVEE)** bonds can be issued by states for transportation projects receiving federal funding with FHWA approval. States repay the funds using anticipated federal funds. GARVEE bonds are useful when it is desirable to bring a project to construction more quickly than otherwise would be possible.

6.2.8 IRS Railroad Track Maintenance Credit Program

This program was authorized within the Internal Revenue Service Code to provide tax credits to qualified entities for an amount equal to 50 percent of qualified railroad maintenance expenditures on railroad tracks owned or leased by Class II or Class III railroads. The maximum allowable credit is $3,500 per mile of track. Legislation was enacted in December 2010 to extend the tax credit program for an additional two-year period and maintain the $3,500 per mile credit limit.

6.3 Federal Capital Funding for High Speed and Intercity Passenger Rail Improvements

The MoDOT Railroad Section has successfully applied for federal HSIPR funding under ARRA, PRIIA and the High Speed Rail Grade Crossing Safety Program under SAFTEA-LU. Since 2007, Missouri has received approximately $179 million in federal funding for capital improvements on the St. Louis to Kansas City corridor to support present and future intercity passenger rail service. This includes $125 million for new locomotives and coach sets, which is Missouri's estimated share of a $268 million grant awarded jointly with Illinois, Michigan and Iowa. These projects are shown in **Table 17**.

Table 17: Federal Rail Grant Awards to Missouri 2007 - 2011

Project Name/ Description	Year	Federal	Federal Source	State	Other/ Host RR	Project Total
Strasburg Crossings UP HSR Corridor	2007	$226,000	Sec. 1103(f)2	$0	$200,000	$426,000
Track Replacement–Flooding in SW Missouri	2008	$353,600	RR Rehab & Repair	$0	$88,400	$442,000
9,000 ft. Siding at Shell Spur near California	2008	$3,000,000	Capital Assistance	$5,000,000	$0	$8,000,000
2nd Osage River Bridge	2009	$22,640,000	ARRA	$0	$5,789,673	$28,429,673
Missouri Rail Crossing Safety Improvements	2009	$1,920,000	ARRA	$640,000	$640,000	$3,200,000
Webster Universal Xover	2009	$2,340,305	ARRA	$0	$2,040,000	$4,380,305
Bonnots Mill Universal Crossover PE/NEPA	2009	$611,200	ARRA	$0	$152,800	$764,000
Knob Noster Siding Extension PE/NEPA	2009	$836,800	ARRA	$0	$0	$836,800
Hermann Universal Crossover PE/NEPA	2009	$570,000	ARRA	$0	$142,500	$712,500
Kingsville Passing Siding PE/NEPA	2009	$958,800	ARRA	$0	$0	$958,800
Strasburg Grade Separation PE/NEPA	2009	$850,000	ARRA	$850,000	$0	$1,700,000
Double Track Lee's Summit–Pleasant Hill PE/NEPA	2009	$1,418,800	ARRA	$0	$0	$1,418,800
Terminal Railroad Track Improvements	2010	$3,608,640	FY2010 HSIPR	$0	$902,160	$4,510,800
State Rail Plan	2010	$500,000	FY2010 HSIPR	$177,695	$0	$677,695
STL Merchants Bridge Replacement–West Approach	2011	$13,500,000	ARRA	$0	$9,000,000	$22,500,000
Centertown–Oak St. Crossing Closure	2011	$60,000	Grade Xing Discretionary	$20,000	$20,000	$100,000
Syracuse–MFA Crossing Closure	2011	$150,000	Grade Xing Discretionary	$0	$50,000	$200,000
Strasburg–Co. Rd. 1971 Crossing Closure	2011	$120,000	Grade Xing Discretionary	$40,000	$40,000	$200,000
Strasburg–Rogers Rd. Crossing Update	2011	$150,000	Grade Xing Discretionary	$50,000	$50,000	$250,000
3 New Train Sets*	2011	$125,000,000	ARRA	$0	$0	$125,000,000
Operating Support for Missouri River Runner	2007-2011	$0	State	$0	$0	$37,975,000
Station Improvements	2007-2011	$0	State	$125,000	$0	$125,000
TOTALS		**$178,814,145**		**$6,777,695**	**$19,115,533**	**$242,807,373**

**Missouri's estimated share of $268 million award received with Iowa, Michigan and Illinois*

6.4 Public Private Partnerships

All rail projects funded by MoDOT require some level of partnering between the state and private railroad companies. MoDOT has been successful in negotiating private participation in publicly-funded rail projects based on the benefits the project provides to the railroad.

Missouri is one of 29 states which has enacted limited legislation allowing the application of public-private partnerships (P3). P3s have application in a variety of transportation projects including freight and passenger rail. One of the keys to creating viable P3 opportunities is to identify areas of mutual interest where the private sector can improve business, and the public sector can meet its goals. Public benefits from private sector involvement may include innovation, financing and project schedule acceleration.

In Missouri, MoDOT has partnered with the private sector on three design-build projects to accelerate project delivery. Two more are currently in procurement. The three state authorized P3 projects completed or in progress include: The New I-64 in St. Louis, the Safe & Sound Bridge Improvement Program, and kcICON, which includes improvements to the Interstate 29/35 downtown freeway loop and a new cable stay bridge spanning the Missouri River in Kansas City. These projects all utilize a design-build approach to allow a private sector design and construction team to achieve project cost savings by integrating constructability into the design and through schedule acceleration. A key method for project schedule acceleration on design-build projects is an overlap where construction can be initiated in certain project elements while final design is being completed in other areas.

While public-private partnerships have not been used specifically for rail projects, this could potentially be a source of financing for a major rail improvement. The use of innovative project delivery methods can assist in controlling public sector costs on rail projects, including station development, and potentially the delivery of high-speed rail service where P3 can be used to transfer financial risk to the private sector.

There are two other finance vehicles available within Missouri which can provide an opportunity for P3 projects. These include Transportation Corporations and Transportation Development Districts.

- ***Transportation Corporations (TC)*** - The 1990 Missouri Transportation Corporation Act allows localities to form non-profit quasi-governmental agencies called "transportation corporations" to develop and oversee transportation projects. TCs are created under the authority of MHTC Partnership Development Program which provides creative means to build or enhance infrastructure within the state of Missouri, including P3 arrangements. Key authorized features of transportation corporations include:
    - Promote and develop public transportation facilities and systems and economic development in Missouri by new and alternative means.
    - Perform many functions normally undertaken by the MHTC and its staff.
    - Secure and obtain right of way and assist in the planning and design of transportation systems.
    - Limit and secure access to a project.
    - Sell and convey excess right of way at fair market value.

- Request the MHTC to act on its behalf for condemnation of land.
- Perform activities and hold property for purely civic, social welfare, and charitable purposes and are, therefore, property and income tax exempt.
- Use any lawful funding method for a project, including tax-exempt revenue bonds, notes fees for services provided, tolls and rent for project construction, operation and/or maintenance. (For toll facility projects, an existing highway/street/road may be relocated and subject to approval by appropriate authorities.) Revenues can be deposited with the MHTC by contract.

Corporations have the ability to redirect local funding sources (such as sales or property taxes) to support a project. For example, in 2004 the Missouri Highway 63 Transportation Corporation was recognized by the National Council for Public-Private Partnership for P3 innovation.[15]

- ***Transportation Development District (TDD)*** – A Transportation Development District is created to serve as an organizing entity responsible for developing, improving, maintaining, or operating one or more projects relative to the transportation needs of a specific geographic area. A TDD may be created by request petition filed in the circuit court of any county partially or totally within the proposed district. There are specific rules concerning filing procedures and content requirements of TDD creating petitions. A TDD serves to fund, promote, plan, design, construct, improve, maintain or operate one or more projects or to assist in such activity. Projects may include any:
  - Street, highway, road, interchange, intersection, bridge, traffic signal light or signage;
  - Bus stop, terminal, station, wharf, dock, rest area or shelter;
  - Airport, river, lake port, railroad, light rail or other mass transit and any similar or related improvement or infrastructure.

  Funding of TDD projects may be accomplished through the creation of district-wide special assessments or property or sales taxes with a required majority voter or petition approval. Other funding sources requiring voter majority approval may include establishing tolls or fees for the use of the project. The TDD may also issue bonds, notes, and other obligations in accordance with the authority granted to the entity for such issuance. TDDs are frequently used by local jurisdictions to provide advanced funding or early funding to infrastructure projects.

6.5 Rail Program Organization in Other States

Research was conducted to review how various states around the country govern and fund their passenger and freight rail programs. A total of 14 states were reviewed for this plan. All of these states have implemented programs to support the development of freight and/or passenger rail services.

[15] The National Council for Public-Private Partnerships, http://ncppp.org/cases/hwy63.shtml

6.5.1 Organization of State Rail Programs

There are a variety of organizational approaches to deliver rail programs at the state level:

- Virginia has an independent state agency for all intercity passenger and freight rail and transit functions
- North Carolina has a bureau function within the North Carolina Department of Transportation which has comprehensive responsibility for all freight and intercity passenger rail activities which currently includes intercity passenger rail equipment purchase and refurbishment and maintenance activities.
- California features an independent High Speed Rail Authority with access to state bond funding for its proposed 800 mile, $90 billion+/- high speed rail system.
- The Illinois Bureau of Railroads within the Illinois Department of Transportation supports a comprehensive freight and intercity passenger rail program with the exception of rail safety which is administered within the Illinois Commerce Commission.
- In Wisconsin, freight and passenger rail programs are now operated out of a Railroads and Harbors Section within a Bureau of Transit, Local Roads, Rails and Harbors in the Wisconsin Department of Transportation. A decentralized Regional Rail Office formed in the Southeast Region for the Milwaukee to Madison high speed rail mega-project has recently been dismantled.
- Minnesota has formed a small Passenger Rail Office to support its early stage intercity passenger rail program.

Each of these approaches has features which could be adopted by MoDOT to support the continued development of the state's freight and passenger rail programs.

6.5.2 Funding

States have developed a variety of programs and funding mechanisms to support the development of both freight and passenger rail services. The availability of federal high speed rail funds beginning in 2009 has been a critical factor in advancing passenger rail programs in those states which have been successful in obtaining funds.

Fifteen states, including Missouri, Virginia, Wisconsin, California, North Carolina, New York, Illinois, Pennsylvania and Washington, contract with Amtrak for the operation of trains supplementing the national Amtrak network. States pay most of the operating costs of these services not covered by fare box revenues. Continued operation of these state-supported routes is subject to annual contracts and state Legislative appropriations, along with Amtrak financial participation. In addition to operating funds, many of these states also provide funds for infrastructure or other capital improvements to Amtrak routes in their states.[16]

Many states have freight rail grant and loan programs designed to provide support for industrial development activities. Examples include:

- Virginia Rail Industrial Access Program
- Indiana Industrial Rail Service Fund

[16]Amtrak, http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&cid=1246041980246

- Wisconsin Transportation Economic Assistance Program
- Iowa Railroad Revolving Loan and Grant Program

Several states have freight rail programs designed to provide capital funding for the preservation, rehabilitation and maintenance of short line railroads. These support short lines which provide freight transportation critical to the businesses and industries served by those railroads. Examples include:

- Virginia Short line Railway Preservation and Development Fund
- Wisconsin Freight Rail Preservation Program
- North Carolina Short Line Infrastructure Assistance Program
- Illinois Rail Freight Program
- Pennsylvania Rail Freight Assistance Program
- Kansas State Rail Service Improvement Fund

7.0 Outreach Activities

7.1 Goals and Objectives

The success of the Missouri State Rail Plan depends on buy-in and support among MoDOT leadership, freight and passenger railroads, key stakeholders and the general public. Ample opportunity must be provided for meaningful input on these issues, and stakeholders must be aware their issues have been heard and addressed. The general public must also have opportunities for involvement and must feel they have been informed, consulted and involved throughout the planning process.

The Missouri State Rail Plan public involvement effort was designed to accomplish these goals. More specific objectives included helping stakeholders and the general public:

- Increase understanding of system-level goods movement and logistics issues.
- Prioritize investments in light of constrained funding resources.
- Strengthen partnerships and coordination with sister transportation agencies, other government organizations, private industry and the public.
- Be responsive to public comments and concerns; provide feedback as appropriate.
- Develop a partnership with the media to ensure accurate reporting of information.
- Build public consensus on the plan, and create sustainable support for an implementation plan which is understandable, feasible and transparent.

7.2 Stakeholder Database

A cross section of all freight stakeholders in the state and region were engaged throughout the development of the plan, including shippers, carriers, terminal operators, economic development agencies, seaport and airport authorities, state and local governments and other public agencies, receivers, distribution and warehousing representatives and commercial and industrial developers.

Additionally, this effort engaged the Missouri State Rail Plan Advisory Committee, the Missouri Rail Passenger Advisory Committee, regional and metropolitan planning organizations, regulatory agencies, communities with Amtrak service or who might someday get Amtrak and intercity passenger rail, the relevant chambers of commerce, and community advocacy groups such as the St. Louis-based Citizens for Modern Transit and those who represent the disability and environmental communities. These “thought leaders” helped share information presented at meetings and helped build widespread ownership in the state rail plan’s recommendations.

When this effort commenced in June 2011, MoDOT had a stakeholder database with 1,214 contacts. By March 2012, the database included nearly 1,600 stakeholders and continues to grow.

7.3 Community Workshops and Public Meetings - Round One

A series of public open house meetings and community leader workshops were held in each MoDOT district across the state in October and November 2011. The purpose of the meetings – both in person and online – was to gather public input on the development of MoDOT's Statewide Rail Plan. As the plan will serve as the strategic framework for the development of both freight and passenger rail service in Missouri for the next 20 years, it was vital MoDOT heard from Missourians to incorporate their needs into this process.

Meetings were held in each of MoDOT's seven districts on the following dates and locations:

Table 18: Round 1 Public Meetings

Date	Location	Community Workshop Attendance	Public Meeting Attendance
October 18, 2011	Hannibal	29	4
October 25, 2011	Jefferson City	20	21
October 26, 2011	Kirkwood	15	50
October 27, 2011	Cape Girardeau	10	6
November 1, 2011	St. Joseph	12	15
November 2, 2011	Kansas City/Independence	35	31
November 3, 2011	Springfield	13	17
TOTAL		**134**	**144**

In addition to the seven open house meetings and seven community leader workshops, MoDOT hosted an online public meeting from October 18 through November 18 at www.morail.org. This online meeting gave those unable to attend a chance to learn about freight and passenger rail in Missouri, ask questions and provide input.

As work on the plan began, public and community leaders were asked to comment on the following:

- The current rail system's ability to serve Missouri's businesses in moving raw materials and finished products.
- The state's interest in and potential ridership of intercity passenger rail.
- The role of publicly funded improvements to move people and goods on privately-owned railroad systems.
- The importance of investing in different types of rail projects compared to other infrastructure needs, given funding limitations.

The public was encouraged to join the open house or online meeting to review project information, ask questions and discuss the plan with MoDOT representatives. At the open house meetings, a presentation was given, followed by a question and answer/comment session. All public meeting sites were wheel chair accessible.

The following provides an overview of the meetings, then highlights the key themes which emerged from the community leader and public input. For a detailed summary of each community workshop and public meeting, see the **Public Meeting Series I Summary Report Technical Memorandum**.

7.4 Meeting Format, Notification and Materials

Two sessions were held in each of seven Missouri communities. The community leader workshop was held with invited guests to provide information on the plan directly to business leaders, elected officials and local transportation and planning experts. A brief presentation was given to describe the purpose and approach of the Missouri State Rail Plan. A question and answer period followed, and participants were encouraged to submit their comments in writing. The second session was designed for the general public and combined an open house and public meeting format, with a presentation and brief question and answer session. Attendees were registered and invited to review exhibits and share their thoughts directly with the project team at each information station.

7.4.1 Meeting Notification and Materials

The public was notified of the opportunity to attend the meetings and provide public comment using these communication vehicles:

- News release was sent to area media
- Invitations were mailed and e-mailed to community leaders
- Meeting notifications were emailed to approximately 1,200 stakeholders statewide
- A notice and meeting materials were posted on www.morail.org and multiple MoDOT and local Facebook sites

7.4.2 Meeting Displays

The open house portion of the public meeting included these information stations:

Figure 7: Public Meeting Displays

Welcome
Station #1 Purpose Vision Draft Goals Deliverables
Station #2 Missouri's Existing Freight Operations Missouri's Existing Passenger Operations
Station #3 The Business Case for Rail What We've Heard So Far
Station #4 Next Steps Comments

A "virtual" version of the public meeting and opportunity for comment was also available at www.morail.org.

7.4.3 Meeting Handouts

Materials available to participants of both the community leader workshops and the public meetings included:

- Agenda
- Missouri Freight Map
- Missouri Passenger Map
- Missouri State Rail Plan Handout
- Meeting Overview and Comment Form

7.4.4 Public Input Highlights and Key Themes

Attendees were aware of and favorable to the economic, environmental and quality of life impacts of both passenger and freight rail, including the following comments:

- Rail reduces truck and automobile traffic on Interstates and local roadways
- Rail is a more fuel-efficient mode of transportation
- Reduces emissions which cause lower air quality
- Freight rail is beneficial to state and local economies
- Passenger rail provides a viable option to driving or flying for short to moderate trips

- Passenger rail development is generally a worthy investment as long as it does not impede the movement of freight by rail
- Investments in rail infrastructure will increase speed, reliability and ridership for passenger service in this corridor, and spur more efficient movement of freight

Passenger Rail Service

Awareness about passenger rail is markedly high and positive among those who attended, particularly in the communities where Amtrak service is available. Consequently, the bulk of the comments indicated a desire for:

- More frequent service (more trains) to more locations
- More convenient schedules, particularly for business travelers
- Improved on-time performance
- Faster speeds
- New equipment

Significant comments/ themes regarding the Missouri River Runner service:

- Improved on-time performance is critical to growing and maintaining ridership
- Increasing the number of trains to create more convenient arrival/departure times and promote more same-day travel and business use
- There is a recognition of and desire for more state investment in passenger rail, even changing the state constitution to make long-term, dedicated funding possible
- Alleviating the single-track bottleneck over the Osage River is seen as a high-priority need
- Frequent complaints about dirty windows and old equipment on Missouri River Runner trains
- Desire for connectivity to the Missouri State Fair in Sedalia
- Service to the tourist attractions at Hermann, Missouri is seen as important and worthy of better service
- A significant interest in studying the extension of service to other parts of the state, most notably Hannibal, Branson, Springfield, Columbia and St. Joseph, as well as commuter rail extensions in St. Louis and Kansas City
- Amtrak becoming a sustainable national system
- A realization rail is subsidized much less than other modes of transportation such as highways and aviation

Freight Rail Service

There is broad awareness of the role of freight rail in Missouri. According to comments from the seven workshops and public meetings, Missourians:

- See freight rail as important to Missouri's economy
- Understand the environmental benefits of shipping by rail
- View the freight rail system as a key part of the state's overall transportation system and as a way to reduce congestion and move heavy loads off of the state's highway grid
- Know Kansas City and St. Louis are the second and third largest freight rail hubs in the nation

- Are aware Missouri has a rich railroading history
- Recognize huge amounts of coal and intermodal freight move through the state
- A few stakeholders see further passenger rail development as a threat to the movement of freight

Significant comments/themes about freight rail included:

- Any improvements to the state's rail infrastructure should benefit both freight and passenger rail and one mode should not impede the other
- Moving freight off the I-70 corridor between Kansas City and St. Louis and onto rail is seen as a priority and a benefit in terms of reducing highway traffic, reducing damage to state and local roadways and reducing air pollution from emissions
- The state should do more to seek out public-private partnerships which could result in moving more freight by rail and increasing economic development
- More should be done to work with businesses which produce mined products and want to ship them more economically by rail
- Promote and develop more intermodal opportunities to provide a seamless connection between rail, highways and ports along the Missouri and Mississippi rivers
- Look for ways to mitigate the impact of seasonal flooding on railroads as some corridors closely parallel the Missouri and/or Mississippi rivers
- MoDOT should continue to alleviate bottlenecks because of the impact they have in delaying freight shipments
- Trucking interests see the state rail plan as a way of improving the transportation system as a whole
- Examine ways to work more with short-line railroad operators
- Explore the possibility of reviving some abandoned or under-utilized rail lines as a means of fostering more economic development in the state's small cities and communities
- Build better relationships between business/shippers and the railroads to both grow business and address concerns over shipping logistics
- Kansas City area stakeholders would like to see more coordination with the railroads in developing more and better rail-served industrial development clusters
- MoDOT needs to continue its focus on increasing rail safety for at-grade crossings and to address traffic congestion caused by trains moving through a city or community

7.4.5 Observations: Funding Rail Improvements

Community leaders and the public provided the following comments regarding funding for rail improvements:

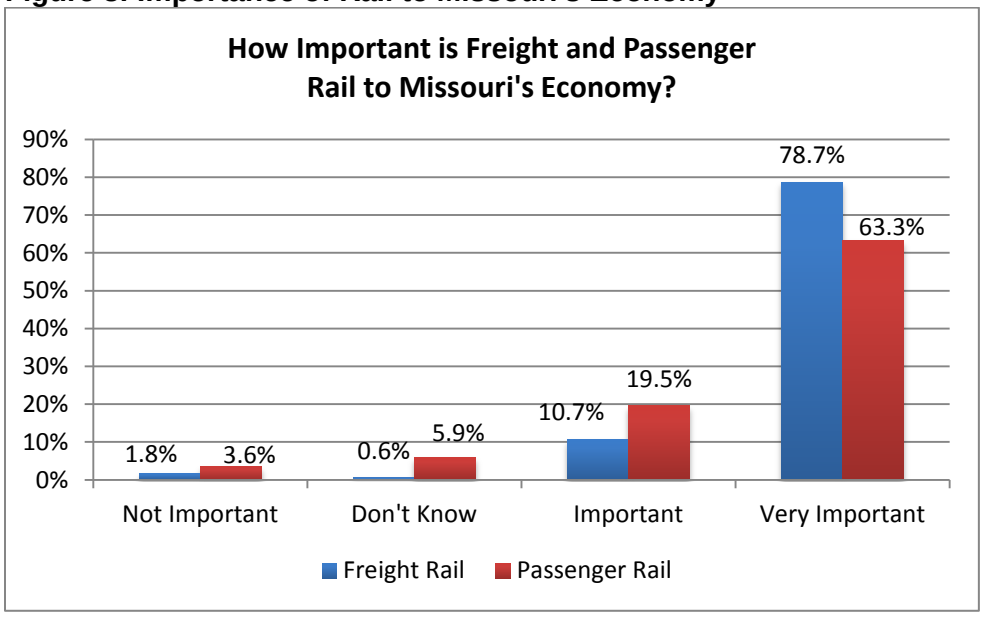
- Continue to support state of Missouri funding of Missouri River Runner service between Kansas City and St. Louis
- Currently, there is no long-term or dedicated funding source for rail
- There is a need to make greater investment in Missouri's rail infrastructure and such investment is worthwhile
- Rail investments should be directed at both freight and passenger rail
- There is lack of knowledge about sources of existing public funding for rail improvements

- There is lack of knowledge about the amounts railroads are investing in Missouri's rail system with their own dollars on both infrastructure improvements and maintenance along railroad right of way
- Interest in what grant and loan programs other states administer to help fund rail projects/programs
- A desire to include a comparison of per-mile costs of both highway and railroad improvements and maintenance costs
- A desire to seek out more public-private partnerships as a way of combining dollars to get rail projects done

7.5 Written Comments

In addition to comments made at the workshops and public meetings, 169 total written comments were submitted (83 comments at the meetings and 86 submitted online at www.morail.org). Respondents were asked how important they thought freight and passenger rail were to the state's economy, with one indicating least important and four indicating most important. **Figure 8** below shows most believed freight and passenger rail are important to Missouri's economy.

Figure 8: Importance of Rail to Missouri's Economy



Of the 169 comments received, about 75 percent indicated freight rail is important to Missouri's economy, and 60 percent indicated passenger rail is also important to the state's economy.

7.6 Surveys

7.6.1 Informed Stakeholder Survey

A targeted, online 10-minute survey was developed to solicit feedback from informed stakeholders including representatives from transit systems, metropolitan planning agencies, regulatory agencies, community leaders with Amtrak service or who might someday get Amtrak,

chambers of commerce, and community advocacy groups such as Citizens for Modern Transit and those representing the disability and environmental activists. The survey questions sought input on existing rail service in Missouri, concerns and opportunities with existing service, benefits of expanding freight and passenger rail, and opinions on how to prioritize rail investments in light of tight financial times.

The survey was sent to 264 stakeholders across the state during the Fall 2011. Eighty-two responded, including five partial and 77 complete responses, for a 31 percent response rate. Highlights of results include:

- Nearly 11 percent of stakeholders surveyed were not aware almost all intercity passenger rail systems in the United States are operated on private railroads.
- Ninety-six percent agreed transportation infrastructure in Missouri does not fully pay for itself, but is funded through a combination of taxes, user fees and public-private partnerships.
- Eighty-one percent support investing public money in private railroads to ease truck traffic on highways
- Eighty-one percent believe those communities with an Amtrak station receive economic benefits through tourism, improved local business opportunities and better access to Kansas City and St. Louis; seven percent believed access to passenger rail provides no economic benefit while 11 percent were unsure.
- Many respondents believed having more access to passenger rail in their communities would attract more visitors (82.5 percent) more retail around rail stations (61.3 percent), more office development (41.3 percent), and more residential development around the station (23.8 percent). Just fewer than 9 percent indicated there would be no development around stations.
- Respondents indicated current passenger rail service is not frequent enough (55.4 percent), not fast enough (51.4 percent), unreliable (44.6 percent) and not accessible enough by other public modes of transportation (35.1 percent).

7.6.2 MoDOT Online Survey

At the outset of the development of the state rail plan, MoDOT posted a survey on its website, www.modot.org. As of March 9, 2012, it had attracted almost 3,000 online respondents. The survey shows Missourians not only have a deep appreciation for the value and service of railroads, but it suggests they also see value in investing federal and state funds to do more to carry people and freight.

- More than 76 percent said if there was a benefit to the state (reduced highway congestion or more reliable passenger service), state or federal funds should be used to fund freight rail expansion.
- More than 91 percent believe passenger rail service and routes should be expanded in Missouri, while 85 percent say they would consider commuting to work or school by rail if it were available.
- Specific to state-supported Missouri River Runner passenger rail service, survey responses indicate the majority of Missourians believe it is both a good value and generally view the service and on-time performance as good. Eighty eight percent say yes to this question:

"The Missouri River Runner currently relies on annual funding from the state legislature. Do you support the continuation of this service?"

- A majority (57 percent) support continued funding; even recognizing such funding is not secure and must be renewed annually by state legislators.
- As to sources of funding, sizeable numbers indicate they would favor using state gasoline tax revenue (48.2 percent) or state sales tax revenue (38.6 percent) to support passenger rail service. More than 32 percent favor a dedicated sales tax to support passenger rail.
- Nearly half (45.9 percent) of respondents indicate increased freight rail capacity should be a high priority.
- Almost 66 percent view shipping by rail as more economically justified and cost effective, while more than half (51.5 percent) view freight rail as more environmentally friendly.
- When those who use freight rail were asked what they view as the biggest issue, 43.1 percent named "congestion" as the primary concern. Less than 20 percent see passenger trains sharing track space with freight trains as an important issue.
- Asked to rank railroad facility or service improvements which would help generate more sales/business for companies or would encourage more businesses to use rail, 36.7 percent rank creating more rail-to-truck transfer facilities as their primary desire and 31 percent suggest more city-owned spur tracks which could be used by multiple companies.

7.7 Project Website and Newsletters

7.7.1 Project Website

Public meeting notifications, materials and study documents were posted on MoDOT's www.morail.org site, and also touted on MoDOT's various Facebook pages, including Missouri River Runner and district Facebook sites.

7.7.2 Newsletters

Four electronic newsletters were sent during the development of the Missouri State Rail Plan. These editions focused on the following:

- Edition one (October 2011): Notification of upcoming public meetings
- Edition two (February 2012): Recap of public meeting input
- Edition three (March 2012): Notification of upcoming public meetings and summary of draft recommendations
- Edition four (May 2012): Recap of the second series of public meetings and final study recommendations

7.7.3 Grassroots Outreach

The project team's extensive grassroots network with transportation advocates and others provide low cost means (email, Facebook, Twitter) to distribute information widely, which will maximize exposure and build further awareness of the effort.

7.8 Public Meetings - Round Two

A second round of public meetings will be held in April 2012 to provide the public with the opportunity to comment on this draft state rail plan. The input provided during these public meetings and all necessary responses will be incorporated into the final state rail plan.

8.0 Financial Analysis of Needs and Benefits

Investment in Missouri's rail system has far-reaching economic impacts on the state's economy. The Missouri State Rail Plan evaluates a series of different economic "investment package" strategies which the state can consider for future rail planning and investment periods. Generally, the potential impacts of the investment packages developed as part of this plan can be understood in two different ways:

1. The economic impact of the rail system on Missouri's earnings, output and employment is realized when money is spent on rail infrastructure and services in the state, as well as from savings accrued by households and businesses benefiting from the use of rail transportation. These impacts are understood in terms of how the money invested in the rail system, or saved because of rail efficiency, work their way through Missouri's economy to create jobs, enhance incomes and allow businesses to produce more.

2. Potential system-level transportation performance/efficiency societal benefits are brought about by significant expansions to Missouri's rail system. This aspect quantifies the value of the overall societal benefit of Missouri's rail system. Unlike the economic impact, the societal benefit does not represent jobs, output or earnings simply moved from one sector of the economy to another, but represents the dollar value of actual savings which accrue directly to households and businesses in dollar terms. Key drivers of the societal benefit of rail include lower vehicle operating costs, safer and more reliable transportation, and lower environmental costs.

This section will describe the economic implications of the potential investments with respect to each of these types of impacts to Missouri's economy. The investments are represented as "investment packages" beginning with a package including only currently committed and programmed passenger improvements, and successively building through two higher levels of investment to a third package which includes rail speed and capacity improvements throughout the state. For freight, the impact of a program to implement strategic rail and rail-to barge projects is considered. All of the improvement scenarios are considered in comparison to today's rail network; so the benefits of committed improvements can be shown, with the benefits of higher levels of funding representing successively greater benefits.

8.1 Benefits of Preserving Current Service

The availability of rail transportation supports significant efficiencies for Missouri's people and businesses. For many commodity shipments, and individual person-trip purposes, rail is far more efficient in terms of travel time and cost advantages than other alternatives. While rail accounts for only a small share of Missouri's overall transportation system, the state has a significant economic stake in preserving and maintaining its rail network and services.

Based on trends from Amtrak's reported ridership data and population forecasts for American counties from *Moody's*, Missouri's rail network is expected to carry more than 805,000 passengers by 2031. According to the 2006 STB Waybill sample (with growth factors from Moody's), Missouri's freight rail network is projected to carry more than 311 million tons in 2012 (71 percent of which is pass through traffic and does not involve transactions in Missouri's economy). If all of these trips had to be carried by passenger cars and trucks (for commodities

which move by truck) on Missouri's highway system, it would place an additional 137 million vehicle miles[17] of travel on the state's highways this year. Over the life of the plan (from 2011 to 2031), if Missouri's rail trips and tonnage had to be carried by the highway system, this diversion of trips would create more than 3.5 billion additional vehicle miles of truck travel on Missouri's highway system. The additional vehicle operating costs, travel time costs, safety, environmental, reliability and other costs of moving Missouri's rail passengers and freight to highway modes would be expected to total more than $1.07 billion over the life of the plan.

The majority of the highway costs accrue to freight movements due to the much higher vehicle operating costs and crew costs of shifting freight from rail to truck. Loss of rail service in Missouri would be expected to generate more than $444 million[18] in additional freight costs due to highway travel. On the passenger side, there would be an expected $775 million in additional highway user costs.

Shifting Missouri's passenger rail and freight traffic to the highway system over the next 20 years would be expected to cost the state's economy 1,000 jobs by 2031, with cumulative economic losses to the state of more than $1.9 billion in economic output, and approximately $988 million in lost income.[19] These losses account for the transportation inefficiency of diverting existing rail traffic to highways. Additional investment in Missouri's rail system will not only prevent the economic and job losses which would occur without the system in place, but may also create additional efficiencies, benefits and economic opportunities for Missouri's households and businesses.

8.2 Investment Packages

Four packages of railroad investments have been identified for further analysis. These packages represent a range of potential improvement projects which have been identified for both passenger and freight rail service in Missouri. The projects included in each investment package are described in **Table 19**.

[17] All findings of highway mileage/VMT associated with shifting rail movements to highway are based on origin-destination pairs from Amtrak data (provided by MoDOT in 2012); estimates from the U.S. DOT Freight Analysis Framework (FAF3), 2011 or U.S. DOT Waybill data, 2006, converted to the equivalent minimum time and distance paths as shown on NAATD network; 2010 roadway networks, with growth rates based on Moody's economic forecast; and distribution trade patterns from Minnesota IMPLAN group.

[18] All costs are shown in 2012 constant dollars.

[19] TREDIS Consulting Group; Division of Economic Development Research Group, Inc. Web: http://www.tredis.com

Table 19: Description of Investment Packages

Investment Package	Description
Scenario 1: Maintain Existing Service	• The **Missouri River Runner** continues to operate at current levels (two round trips per day) with all projects currently funded with federal grants completed. These improvements will ensure quality service with new passenger rail cars and a high on time performance (90 percent). Ridership can be expected to continue to grow at a rate consistent with the previous five years (10 percent - 15 percent per year) until the maximum capacity of the train sets (approximately 350 passengers per train) is reached. • **Lincoln Service –** the state of Illinois will complete construction of currently funded improvements on the St. Louis to Chicago corridor which will allow maximums speeds of 110 mph, reducing travel times from 5 hours 40 minutes to 4 hours. • The two long distance trains serving Missouri, the **Southwest Chief** and the **Texas Eagle,** will continue to operate on the existing routes and schedules with no changes to the service.
Scenario 2: Expanded Missouri River Runner	• A **third round trip** is added on the Missouri River Runner between St. Louis and Kansas City. • **Feeder bus service** is added between Jefferson City and Columbia and between St. Joseph and Kansas City connecting to all three round trip trains. • All other services remain the same as the maintenance level in Scenario 1 above.

Scenario 3: Future Service	• **Missouri River Runner** service upgraded as recommended by MWRRI:
	  ◦ Maximum speeds increased to 90 mph
	  ◦ Six round trips per day
	• Conventional (79 mph maximum speed) service implemented on the "**Missouri Triangle:**"
	  ◦ St. Louis to Springfield (one round trip per day)
	  ◦ Kansas City to Springfield (one round trip per day)
	  ◦ Feeder bus service between Springfield and Branson
	• The **Illinois Zephyr** and **Carl Sandburg** service between Chicago and Quincy extended to Hannibal (two round trips per day).

Scenario 4: Enhanced Freight Access	If a program were made available to support selected rail and rail-to-barge projects essential for contingent development, representative projects considered for modeling purposes include: • The KCT North-South Terminal Project. • Semo Port enhancements for which state funding has already been sought, including loop track, construction, bridge, track improvement, and rail business park access. • Track and bridge improvements in Ste. Genevieve and New Bourbon counties enabling further development of the non-metallic mineral industry in the area. • Pemiscot Port rail extension and rail harbor service. • Jefferson County rail improvements in Herculaneum, Crystal City and Pevely, supporting development of non-metallic mineral manufacturing, mining and transportation industries in the area.

These four different investment packages have construction costs ranging from $93.34 million to $1.5 billion over the 20-year plan study period. Three of the investment packages represent successively aggressive investments in the passenger rail system, and one package (Scenario 4) explores the economic impact of improved freight rail access on Missouri's economy.

The general approach used to determine the economic impact of a series of different economic investment packages involved the following steps:

1. Summarizing for the life of the plan, the total dollars spent on rail infrastructure and services under each package.
2. Applying appropriate assumptions regarding what percentage of this spending occurs within Missouri, and in which Missouri industries the spending occurs.
3. Using ratios from IMPLAN to estimate the number of jobs, and the amount of personal income rail spending will create in the state's economy.
4. Using multipliers from IMPLAN to calculate how this spending works its way through Missouri's economy. The multipliers can be understood as providing a measure of the 'ripple effects' of this spending working its way through Missouri's economy.
5. Using the same methodology as described above to determine the impact of tax increases associated with each package, if applicable, and subtracting the adverse impacts of tax increases from the beneficial impacts of investment is to arrive at a net economic impact from the different spending levels.

When the economic impacts are reported, they are summarized as totals, which include direct, indirect and induced impacts.

- **Direct Impacts** are those initial economic activities generated by a project also known as the first round of spending. For a rail project, this could include laying new railroad track or adding a station or terminal.
- **Indirect Impacts** are the economic changes occurring in business which supply the inputs to the project. In our example of new railroad track, this would include the spending associated with purchasing steel from a steel manufacturer which produces railroad track. This spending continues to cycle through the economy until it is exhausted. Impacts are limited to the spending occurring within the project region, which in this case would be the state of Missouri.
- **Induced impacts** are the economic effects of spending by employees or households as the result of direct or indirect spending. In our example, this would include the spending by employees who laid the railroad track or employees of the steel manufacturer. This is captured when they spend their new income within the region.

Table 20 summarizes the investment levels associated with each investment package for passenger and freight over the 20 year planning period from 2011-2031. The table separates the state of Missouri's investment share from federal and private sector railroad investments required for each investment package. For example, the $93.34 million "Maintain Existing Service Scenario I" shows current state, federal and railroad investments in passenger and freight rail service in Missouri.

Table 20: Proposed Investment in Missouri's Economy

Cost Assumptions Regarding Passenger Rail Improvement Scenarios					
Infrastructure Investments & Programs	**Investment Levels**		**Sources**		
Project or Investment Description	**Total Construction Outlay ($M)**	**Average Annual O&M ($M)**	**$ of Revenue from Existing Sources**	**$ of New Revenue Raised from MO Economy**	**% of New Revenue Invested from Private or Federal Sources**
Scenario 1: Maintain Existing Service	$93.34	$8.00	9.4%	0%	90.6%
Scenario 2: Expanded Missouri River Runner	$153.00	$3.00	0%	3.4%	96.6%
Scenario 3: Future Service	$1,524.00	$9.50	0%	20%	80%
Scenario 4: Enhanced Freight Access	$199.88	$7.71	0%	0%	100%

8.3 Economic Impacts of Rail System Investment

The investment scenarios described above analyze different levels of state, federal and private investment in Missouri's rail system. Because opportunities often exist to attract federal and private matching funds into Missouri's economy, this section explores the statewide impacts associated with each investment package. The benefits include both the impact of additional spending brought into the state as well as the overall impact of the transportation efficiencies on earnings, output and employment achieved by Missouri's private sector as a result of improved rail service.

The analysis also considers the adverse impacts of raising taxes or user fees to generate the required state match which would likely be needed to achieve the levels of outside investment given for each service package. However, for the "Maintain Existing Passenger Service" scenario, it is assumed the state funding to support this scenario comes from existing committed sources, and does not represent a shifting of funding away from other state programs.

Because this analysis is made from the standpoint of Missouri's economy, the impacts given in this section are not limited to reporting only net new economic benefits to the United States as a whole, but include the transfer of jobs, earnings, output, income and value-added into Missouri which may have otherwise occurred elsewhere in the U.S. if Missouri did not receive the outside investment associated with each investment package.

Table 21 summarizes the overall net economic impact of spending and associated tax increases required to implement each of the rail investment packages (including direct, indirect

and induced impact of new spending less the offsetting impact of state taxes raised to support the needed state matches).

Table 21: Net Economic Impact of Investment Scenarios after Tax Impact

Project or Investment Description	Missouri Earnings (Cumulative 2011-2031) $M	Missouri Output (Cumulative 2011-2031) $M	Missouri Jobs (Average for Period 2011-2031)
Scenario 1: Maintain Existing Service	$190	$481	195
Scenario 2: Expanded Missouri River Runner	$277	$922	334
Scenario 3: Future Service	$5,181	$14,000	6,242
Scenario 4: Enhance Freight Access	$19,128	$85,214	16,224

The “Maintain Existing Service” scenario shows positive impact for Missouri’s economy, even though the investment level in rail does not increase. This is largely because Missouri will benefit from the improvements to the Lincoln Service, and Missouri households and businesses will enjoy a better economic climate as a result.

The “Expanded Missouri River Runner” scenario is shown to have positive impacts on Missouri’s economy, which result both from the assumed additional outside revenue supporting the service, as well as from the transportation efficiency of the service.

The “Future Service” scenario enables significant expanded passenger service beyond the Missouri River Runner. This scenario assumes an order of magnitude of greater outside investment in Missouri’s economy which provides an overall positive impact on earnings, output and employment in the state’s economy significantly greater than the increment in the investment level. The outside investment level for Scenario 3 is approximately 10 times higher than in Scenario 2 (as shown in **Table 20**), however the positive impact on state output is of nearly twice the magnitude (Scenario 3 has nearly 18 times the impact on the state’s economic output as Scenario 2 - as shown in **Table 21**, while relying on only 10 times more money). This is primarily because the “Future Service” scenario involves a significantly higher flow of outside money into Missouri. As will be shown in the subsequent analysis on transportation benefits, while the influx of money assumed by this scenario could generate significant jobs in Missouri’s economy, the societal benefit of the services offered does not rise in proportion to the money spent and jobs created.

The analysis also shows the greatest positive impacts on the state’s economy would likely come through funding the freight access enhancements. The enhancements in the “Enhance Freight Access” scenario are expected to have more robust impacts than other investments because

they are part of economic development strategies specifically intended to bring additional jobs into the state.

Consequently, funding the "Enhance Freight Access" scenario would not only rely on reduced transportation costs to generate impact in the state's economy, but it would also bring mining, nonmetallic mineral manufacturing, and crop production jobs to many rural counties. The KCT North-South Terminal Project is an especially significant element of this package. It brings more than $243 million of direct output in the Kansas City region's transportation sector over the life of the plan.

8.4 Societal Benefits from Investing in Missouri's Rail System

In addition to bringing new jobs and economic impact to Missouri through federal and private investment in the rail system, the investment packages of the state rail plan also provide opportunities to improve the overall efficiency of Missouri's transportation system, creating net societal benefits from investment at different levels. Some investments are expected to have significant and quantifiable improvements in both travel operating costs (i.e., vehicle operating costs, safety, emissions and reliability) and travel time savings.

8.4.1 User Benefit Analysis Key Assumptions

These investments offer some changes in the type and quality of service available from Missouri's rail network. This section explores the benefits available to Missouri's economy by analyzing the user benefits when improvements are made in passenger rail speed and capacity.

The approach used to determine the economic benefit of a series of different economic investment packages involved the following steps:

1. Developing background assumptions about anticipated future trends in passenger car and truck vehicle miles traveled (VMT) and vehicle hours traveled (VHT) at the statewide level, based on current trends. This includes an assumption about modal shares, passenger car and truck traffic growth for rail and highway modes based on historic trends in Amtrak statistics and overall population growth in areas currently or potentially served by the packages.
2. Ascertaining potential changes from baseline conditions likely to occur with different funding scenarios in terms of passenger VMT and VHT. Any significant changes in rail speed or capacity which increases or decreases the rail mode's share of passengers or freight tonnage are analyzed. Personal miles of travel are adjusted to account for potential modal diversions from truck to rail or vice versa. Rail VHT is also adjusted to account for increased travel speeds for packages where investments are expected to increase travel speeds.
3. Applying appropriate travel time cost factors to changes in VHT by mode, and appropriate vehicle operating cost factors to changes in VMT by mode. Because passenger cars and trucks have different safety, environmental, reliability, travel time characteristics and per-mile travel costs, the different modal shares, speeds and routings found in Step 2, result in different overall user costs or savings in Step 3.
4. Developing a time series of impacts accruing by year based on Amtrak historical growth factors and anticipated population and employment growth in areas served, and applying an

appropriate discount rate (3 percent) to report user benefits of any given package. Just as highway traffic demand increases over time, so does the potential level and overall benefit of diverting highway traffic to rail. The analysis assumes trips diverted from highway to rail will increase over the life of the plan at the same rate as other highway trips.

5. Summarizing and classifying user benefits into safety, logistics, reliability, travel time, operating cost and other categories based on the cost factors applied for each of these categories in Step 3.

6. The analysis of user benefits discussed in this section is given in 2012 constant dollars, and is based on Amtrak[20] ridership data combined with the North America Transportation Atlas Data (NORTAD)[21] rail network travel time and distance assumptions in relation to U.S. DOT FAF3 network highway travel time and distance assumptions, analyzed in conjunction with capacity changes taken from the following:
   - Midwest Regional Rail Initiative study on high-speed rail;[22]
   - Passenger Inter-city Cross-modal Elasticities from the U.S. Conference of Mayors High Speed Rail Study;[23] and
   - Cost factors available through EDR's TREDIS system.[24]

The analytical framework above was used for estimating societal and user benefits of both preserving existing passenger rail service (**Section 8.1** above) and for estimating passenger rail expansion benefits. On the freight rail side, societal benefits were estimated just for the preservation of existing freight rail service. Input data limitations prevented the quantification of societal expansion benefits of proposed freight rail improvements (Scenario 4). The following discussion thus focuses on passenger rail speed and capacity improvements.

8.5 Comparative Benefits of Passenger Rail Investment Packages

Each of the passenger rail investment packages is found to offer different economic efficiencies (or inefficiencies) relative to today's conditions over the 2011-2031 life of the plan. This section summarizes the comparative benefits of each package.[25]

All findings of highway mileage/VMT associated with shifting rail movements to highway are based on origin-destination pairs from Amtrak data (provided by MoDOT in October 2011); estimates from the U.S. DOT Freight Analysis Framework (FAF3), 2010; or U.S. DOT Waybill data, 2006, converted to the equivalent minimum time and distance paths as shown on the NORTAD and FAF3 networks for rail and highway times and distances, respectively.

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[20] Amtrak 2010 ridership data, provided to MoDOT in January 2011.

[21] North America Transportation Atlas Data provided by U.S. Bureau of Transportation Statistics, 2011.

[22] Economic Impacts of the Midwest Regional Rail System, Transportation Economics and Management Systems, Inc. and HNTB, November 2006.

[23] The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas, U.S. Conference of Mayors, 2011.

[24] Transportation Regional Economic Development System, licensed by EDR Group to MoDOT, September 2010 - February 2011.

[25] As discussed in 8.4.1 above, data limitations did not allow for a similar comparison of the enhanced freight access scenario.

Scenario 1: Maintain Existing Service: The "Maintain Existing Service" scenario assumes implementation of the high-speed Lincoln Service from St. Louis to Chicago, resulting in a projected shift of 2.45 million passenger VMT and more than 38,000 passenger VHT from Missouri's highway system to the Amtrak system over the life of the plan. This is expected to create a societal benefit within Missouri of $53.49 million above what would have been the case if the Lincoln Service were not implemented. Approximately 62 percent of these societal benefits are expected to be in the form of reduced personal travel time, 17 percent due to reduced business travel time, 15 percent are attributable to reduced motor vehicle operating costs, and the remaining 6 percent are due to reduced highway crash incidence.

Scenario 2: Expanded Missouri River Runner: Over the life of the plan, the "Expanded Missouri River Runner" scenario offers approximately $149.1 million in societal benefits above and beyond the benefits accruing from today's rail conditions and performance. The benefits accrue because of modal diversion resulting from the increased access and capacity of the Missouri River Runner. Overall, these passenger improvements have the potential to shift nearly 40 million VMT and nearly 634,000 passenger VHT from Missouri's highway system to the rail system.

Scenario 3: Future Service: The "Future Service" scenario offers more than $2.045 billion in societal benefits above and beyond today's conditions and performance. These benefits include all of the benefits of the Lincoln Service (from Scenario 1) and the expanded Missouri River Runner service (from Scenario 2), as well as the benefits of significantly enhanced speed on the Missouri River Runner to 90 mph; a doubling of its capacity from today's levels; new services between St. Louis, Kansas City and Springfield (the Missouri Triangle), and feeder bus routes; and extending the Chicago – Quincy service to Hannibal. All of these improvements combined, including Scenarios 1 and 2 are expected to yield a shift of 463 million VMT and 1.33 million VHT from Missouri's highway system.

Table 22 provides a comparative summary of the user benefits available over the life of the plan for the three passenger rail investment packages as they relate to each benefit category (i.e., preservation, rail expansion, passenger rail expansion, operation and maintenance, etc.).

Table 22: Estimated User Benefits of Passenger Rail Investment Packages

Benefit Classes	Investment Packages (millions in 2012 dollars)		
	Scenario 1: Maintain Existing Service	Scenario 2: Expanded Missouri River Runner	Scenario 3: Future Service
Passenger Preservation Benefit	$775.98	$775.98	$775.98
Freight Preservation Benefit	$444.28	$444.28	$444.28
Expansion Benefit	$53.49	$149.08	$2,045.46
Overall Benefits of Package	**$1,273.75**	**$1,369.34**	**$3,265.72**
Total Improvement Costs	$92.03	$226.50	$1,394.21
Total Operating Costs	$122.46	$168.80	$306.49
Total State Dollars Spent	**$20**	**$13.44**	**$340.14**
Total Dollars Spent	**$214.49**	**$395.30**	**$1,700.70**

Source: TREDIS[26]

8.6 Conclusions

Overall, the transportation efficiencies of preserving Missouri's rail system in the condition it is in today is expected to protect nearly 1,000 jobs, provide $1.9 billion in economic output, and add $988 million in personal income over the life of the state rail plan.

The net economic impact of rail investments can be significant in terms of earnings, output and job creation. The estimated economic impacts of the three passenger rail investment scenarios range from $190 million to $5.181 billion in earnings. Passenger rail output impacts range from $481 million to $14 billion and job creation impacts are estimated to range from 195 to 6,242 net new jobs. The enhanced freight access scenario is estimated to have an earnings impact of $19.12 billion, an output impact of $85.2 billion and the potential to create up to 16,224 net new jobs.

Investing in improved rail operations can also provide societal and user benefits by reducing vehicle operating costs, travel time, safety and environmental costs of utilizing the state's highway system by diverting existing highway trips to the rail network. Passenger rail investments such as the "Expanded Missouri River Runner" scenario, new service in the "Missouri Triangle," and additional feeder bus routes can also have substantial user benefits depending on the level at which these improvements are funded. The potential new benefits of investing in expanded passenger service range from $53.5 million to $2.05 billion over the life of the plan.

While the economic impact and economic benefits offered in this state rail plan are of a general nature (and are based on broad assumptions from previous analyses), the analysis suggests

[26] TREDIS Consulting Group; Division of Economic Development Research Group, Inc. Web: http://www.tredis.com

Missouri's economy would enjoy net benefits and positive impacts from the investments considered in the plan, with societal benefit and positive impact increasing with the level of investment. For jobs, the analysis suggests there may be particular leverage in funding strategically selected freight-to-barge improvements which generate new economic activity in the state of an order of magnitude beyond the original investment.

Overall, the economic analysis demonstrates significant loss of service from today's levels is likely to have an adverse effect on the state's economy, and investment at or beyond the "Maintain Existing Service" scenario can prevent any adverse effects of underfunding.

9.0 Other Societal Benefits of Rail Investments

Rail transportation has the potential to provide significant benefits for the state of Missouri. Both passenger and freight rail services provide an alternative to less efficient transportation modes. By diverting passengers from automobiles and freight from trucks, rail provides significant benefits from reducing congestion and wear and tear on roadways, to reducing fuel consumption and reducing emissions of pollutants. Rail transportation is also a catalyst for economic development and job creation. Access to freight rail transportation helps encourage the development of new businesses and the expansion of existing businesses. Passenger rail services can be an important catalyst for shaping communities and spurring growth around rail stations.

To analyze the potential benefits generated by the rail projects being proposed in this plan, broad criteria were established to determine the impact of the implementation of those projects. Projects have not been evaluated individually; rather, they have been grouped into investment packages as described in Section 7.0. These packages of projects were then analyzed to determine the economic benefits generated by each. For each bundle, the benefits derived from passenger service improvements and freight rail improvements were separated out and direct, indirect and induced economic benefits were calculated.

Quantitative assessments of the energy, air quality, transportation, land use, noise and vibration and other environmental impacts of rail have not been conducted for this plan. A general description of the types of benefits accruing from rail projects is included below.

9.1 Environmental Considerations

Over the years MoDOT has demonstrated its leadership in carrying out environmental reviews under the National Environmental Policy Act (NEPA) and other federal and state regulations through its initiatives of streamlining, environmental stewardship, innovative public outreach, and stakeholder inclusiveness through context sensitive solutions. The state's multi-modal transportation needs are greater than ever and MoDOT is committed to meeting these needs in more sustainable ways while ensuring valuable community, historic and natural resources are protected for future generations.

The environmental planning goals of MoDOT's rail infrastructure projects include:

- Building a credible environmental review process which facilitates open and unbiased project decision making;
- Ensuring a highly proactive and individualized approach to public involvement; and
- Optimizing the character and amenities of rail corridors and the communities and neighborhoods through which they pass, while improving the state's freight and passenger rail mobility and access.

The purpose of this section is to present the environmental considerations and benefits for the selected and prioritized rail projects. Implementing intermodal, freight, passenger and commuter rail projects could potentially affect and/or potentially benefit the environment, the transportation network, and the communities and local economies along the selected project routes. For each of the priority rail projects, some level of environmental analysis review will

need to be accomplished along with conceptual and preliminary design. This analysis is especially important in the areas of proposed new track, rail stations, parking areas and new operations/maintenance facilities which may be required. State and federal environmental database searches for selected corridor routes, field investigations, and resource impact analyses will need to be conducted. The potential environmental benefits, such as reduced fuel consumption, improved air quality, increased economic development, and potential for transit-oriented development, will need to be assessed and documented for the respective rail projects. This section focuses on the potential benefits or impacts of the priority rail projects for the following resource areas: energy, air quality, transportation (including public safety), land use and community resources, noise and vibration, and other environmental considerations.

9.1.1 Energy

Rail travel is the most energy efficient land-based transportation mode in the country. Railroads, on average, are more than two and one-half times more fuel efficient than trucks as measured by ton-miles per gallon of fuel.[27] Also, because greenhouse gas emissions are directly related to fuel consumption, every ton of freight moved by rail instead of truck reduces greenhouse gas emissions by 53 percent.[28]

All types of rail construction, whether new, upgrading existing rail corridors or typical rail maintenance activities for existing train service, will require temporary additional energy consumption. These activities will have short-term energy impacts lasting as long as the construction phase of the project. However, implementing the Missouri rail projects listed in this state rail plan would provide net benefits related to energy consumption in the state. Energy efficiency, fuel conservation and emissions reduction are important environmental issues all transportation sectors need to address.

For passenger rail projects, energy consumption is usually estimated for the existing and future transportation modes in the proposed rail corridor. The basic data used to calculate energy consumption are ridership estimates, calculated as person-miles of travel (existing and future person trip data multiplied by the estimated number of corridor miles), and energy consumption rates for rail travel, estimated from the proposed rail operations. Energy consumption units for all travel modes are converted to a common base unit, the British Thermal Unit (BTU), to allow comparison between transportation modes. Depending upon ridership forecasts, rail travel is more efficient than automobile or air travel, but less efficient than bus travel. Increases in rail ridership in the future could reduce fuel consumption per passenger as the same numbers of trains carry more passengers, but at fuller capacity. Generally, intercity passenger rail service uses 21 percent less energy per passenger mile traveled than automobiles and 17 percent less than airline travel.[29]

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[27] Texas Transportation Institute. A Modal Comparison of Domestic Freight Transportation Effects on the General Public, Executive Summary. December 2007.

[28] Ibid.

[29] Oak Ridge National Laboratory. Transportation Energy Data Book, Edition 26. May 2007.

Railroads are a more energy efficient mode for moving goods over land than trucking. A typical freight car can carry up to 110 tons of cargo, as compared to 25 tons in a typical truck trailer.[30] One gallon of fuel will carry one ton of freight 413 miles via rail, as compared to 155 miles by truck.[31] Therefore, moving more goods by rail is an important way to reduce energy use and greenhouse gases.

9.1.2 Air Quality

The implementation of new passenger rail service is expected to improve air quality in the region where it is operating, thereby providing another benefit to the environment. This is because the number of vehicle miles traveled would be reduced, thereby reducing the commensurate automobile emissions. A related positive effect of reducing traffic congestion would also lower the amount of carbon monoxide (CO) pollution created, as well as hydrocarbons and nitrogen oxides (NOx). Rail locomotives may create some localized new air emissions from both long-haul trips and maintenance yard operations. There may be some modest isolated increases in locomotive pollutants such as particulates, nitrogen oxides, and sulfur oxides (SOx) most often due to idling train locomotives. However, the reduction in commuter vehicle miles and associated automobile emissions would greatly offset any potential increase in emissions from locomotives for carbon monoxide and hydrocarbons.

The air quality benefits occur because auto users switch to more energy efficient passenger rail service. Approximately two-thirds of train passengers previously used their private vehicle. These "diverted" passengers reduce overall VMT and contribute to reduction of traffic congestion and air pollution. The reduction in carbon monoxide is especially important since it is a major component of the classification process for air quality attainment.

Nationally, freight railroads account for a small percentage of greenhouse emissions compared to motorized vehicles, especially trucks. Most transportation related greenhouse gas emissions are due to motorized consumption of fossil fuels such as petroleum. Any increase in particulate matter and nitrogen oxide emissions is usually caused by locomotive use of diesel fuel and is most prevalent only with idling locomotives. Because freight rail transportation is expected to increase significantly, overall fuel savings and reduced greenhouse gas emissions are expected.

On a community level, the potential for some localized air impacts at selected locations where motor vehicles are delayed waiting for trains at highway-rail at-grade crossings can occur, but the effect is usually minimal. When air quality studies are required, coordination with the Missouri Department of Natural Resources and the U.S. EPA would be accomplished during the early preliminary engineering phase and air quality modeling done if appropriate.

Under the Clean Air Act, the EPA has developed a national program to reduce emissions from diesel engines, including railroad locomotives. To respond to this program, the railroads are working to reduce fuel consumption in a number of ways: more fuel efficient locomotives,

[30] Texas Transportation Institute. A Modal Comparison of Domestic Freight Transportation Effects on the General Public, Executive Summary. December 2007.

[31] Ibid.

locomotive monitoring systems for optimum operations, railroad engineer training, information technology, and reduced idling in rail yards and on side tracks.

9.2 Transportation

Implementing passenger rail service in the rail project corridors will provide residents of these metropolitan areas the benefit of having another way to use public transit to go to work, to go shopping, or attend entertainment, recreational and cultural events. Experience has shown nationally even if ridership projections are initially modest, the new rail system once in place will attract riders who formerly drove a vehicle to work and, in practice, ridership usually exceeds projections. This is true of both commuter rail and intercity passenger rail services. The benefit of expanded or new passenger rail service is any reduction in peak hour traffic on the major highways, which will relieve traffic congestion and improve travel speeds and LOS.

Savings in VMT will occur as a direct result of the removal of vehicles from the roadway system. Another potential benefit is time savings, measured in VHT, which also results from both the direct effects of fewer vehicles on the roadways and the improvement in travel times resulting from lower traffic volumes during peak hours. Rail service in new or expanded rail corridors provides better regional access and mobility, especially for those riders who do not own vehicles.

Most rail riders arrive at the train stations by automobile. This could increase traffic volumes in the immediate vicinity of the stations and parking lots. Proper access, design and intersection controls can mitigate any potential traffic congestion due to ridership demand. Also, the availability of local transit connections to a rail station can significantly reduce the number of automobile trips at the station.

Any new rail service can have an impact on public safety. While the safety record of passenger train travel is significantly better than the safety record for highway travel, any expansion of rail service has the potential to increase traffic safety impacts related to changes in traffic volumes and congestion in the rail station and parking areas, and in increased rail line volumes (number of trains per day) at highway-rail at-grade crossings. The additional trains running in a rail corridor present more opportunity for train/auto/pedestrian conflicts. This can be mitigated by the provision of enhanced grade crossing protection devices on these corridors. Grade separations and grade crossing closures should also be considered to reduce these conflicts. At stations, provisions for a grade-separated route for pedestrians should be included wherever feasible to minimize the potential for incidents.

Education and enforcement programs to increase public awareness of grade crossing safety are an integral part of an overall public safety program for communities. MoDOT is involved with the national Operation Lifesaver program through which railroads, law enforcement agencies and others provide grade-crossing safety education to communities around the state.

9.3 Land Use and Community Resources

Several rail service benefits related to land use and community resources are discussed in the sections below.

9.3.1 Land Use Compatibility

Since freight and passenger rail operations have been ongoing in the state of Missouri for more than 150 years, many existing rail lines and future corridors have been incorporated into local and regional land use and comprehensive plans as an integral part of the transportation infrastructure. Freight lines serve established industrial areas which originally developed in large part due to their proximity to rail, including large-scale facilities for the processing, storage and transfer of both raw materials (coal, grain, timber, ore, etc.) and manufactured goods (automobiles, finished lumber, etc.). Based on long-range plans prepared by local municipalities, these areas are either targeted for industrial retention and growth based upon the advantages of proximity to rail and the potential for intermodal transfer, or for redevelopment with new uses. New passenger rail routes, which will follow the same track alignment as the freight lines and Amtrak routes, are in most cases fully compatible with existing and/or planned land uses.

In areas targeted for industrial retention, investment in freight rail infrastructure and coordination with roadway investment to ensure the viability of intermodal operations will encourage private sector business investment. Maintaining industrial activity in historically rail-served locations often brings the advantages of job creation in close proximity to an established workforce and the ability to serve these areas with existing or upgraded infrastructure. When historically industrial areas are abandoned in favor of sites served only by the highway network, the costs for new infrastructure expansion, coupled with the challenges of redevelopment of the brownfields left behind, result in higher public costs overall. The benefits of investment in maintaining freight rail infrastructure are particularly clear when considered in this broader context.

The implementation of passenger rail service frequently results in transit-oriented development (TOD) near rail stations to serve rail passengers, spurring investment which serves both existing neighborhoods and areas targeted for a transition from industrial uses to urban infill development. This can occur at a range of scales depending upon the quality and frequency of service. For example, dry cleaners, restaurants, newsstands, coffee shops and day care centers are common complimentary services which would attract daily rail riders. Synergies with transit in downtown locations often produce a much more dynamic mix of commercial and retail uses, including office uses. The introduction of passenger stations in existing or planned commercial settings strengthens business and development opportunities. This transit-oriented development provides a potential land use benefit to the cities and communities which have rail stations. The existing and proposed stations in major Missouri cities, such as Kansas City and St. Louis, may benefit from enhanced commercial development near the rail stations.

Over the last decade in particular, passenger rail systems have generated demand for convenient housing near rail stations. This is particularly true for commuter rail systems, which are designed to provide transportation between suburban residential areas and central employment areas. Available housing within walking distance of stations is desirable, especially for those passengers who are daily commuters. Passengers enjoy a living environment which includes walkable commercial and entertainment conveniences. The mix of housing and commercial uses creates a unique lifestyle choice for home buyers. Urban dwellers also choose to live in these mixed use “transit villages” because transit affords the opportunity for

families to eliminate the cost of an automobile, which is no longer necessary due to job access by transit. The change in commuter mode has the benefit of VMT reduction and air quality benefits described above.

Historically, the cost of housing has not included the cost of transportation, particularly in relation to commuting patterns. Traditionally, housing is considered affordable when it demands less than 30 percent of the household budget. The reality, however, is those who purchase more affordable housing at a greater distance from job centers pay a premium in transportation costs. Recent research undertaken by the Center for Neighborhood Technology (CNT) illustrates households located in "transportation efficient neighborhoods," such as transit villages, can achieve 15 percent to 28 percent in real cost savings due to reductions in transportation costs.[32] Passenger rail transit creates the development opportunities to provide affordable housing options at greater distances from job centers, and should have the same effect in reduction of household transportation costs.

Implementing new rail service should promote beneficial land use infill and redevelopment in the station areas, including higher density development patterns overall. Public agency diligence in station area land use planning and infrastructure programming for multi-modal access is essential to attracting private investment and creating the environmental advantages discussed. For some rail projects, there may also be opportunities for brownfield redevelopment. All of these conditions would improve economic activity in the rail service corridor.

9.3.2 Right of Way Acquisition and Potential Displacements

Construction of new rail stations in urbanized areas will likely require property acquisition. In many cases, property located next to the railroad tracks or existing stations is owned by the freight railroads. Residential or commercial displacements can sometimes occur. If additional parking is needed at a rail station, property may be needed for this use. Coordination with property owners would need to occur during the design phase of project development. Typically, however, limited new right of way would be required for track improvements associated with new rail projects. Further design study would be required during early preliminary engineering to determine what exact right of way needs, if any, are necessary.
If any business or residential relocations are necessary they would need to be accomplished in accordance with the procedures of the Uniform Relocation Assistance Act. Relocation payments in addition to the purchase price of real property would occur if businesses or residences are displaced and relocated as a result of rail station and parking lot construction.

9.3.3 Environmental Justice and Title VI Issues

Federal Executive Order number 12898 was implemented to ensure low-income households, minority households and minority business enterprises are an integral part of the community outreach and decision-making process, and they do not receive a disproportionate share of adverse environmental impacts for projects which receive federal funds. An environmental justice screening for new rail projects must be accomplished to ensure low-income persons or minority populations are not discriminated against during project decision making and no neighborhoods would be affected differently by the potential physical impacts.

[32] http://htaindex.cnt.org/

Also, it is important to ensure lower income and minority populations are not denied the benefits of the proposed rail or transit project, there is equity in the transportation investment being made, and they are not burdened with a disproportionate share of the impacts. Title VI of the Civil Rights Act of 1964 requires federal programs and expenditures to be not discriminatory and that the benefits of federal investments are shared across all populations. A Title VI screening should also be considered and accomplished on rail projects. If environmental justice or Title VI issues are identified, they must be properly addressed during the project development and NEPA review process.

9.4 Noise and Vibration

Trains are an intermittent source of noise. Trains produce noise in four ways: internal combustion (diesel) engine operations, steel wheels on steel rails, braking, and mandatory warning noises (i.e., locomotive horns and bells). On existing freight and passenger rail lines, land uses abutting the existing rail corridor are already exposed to some noise from existing railroad operations. Increases in the speed and frequency of passenger rail service will result in an increase in sound exposure at locations adjacent to rail corridors. Since much of the land abutting rail corridors is commercial and industrial, anticipated noise impacts would be minimal. However, in more densely populated residential areas the increase in train noise could be perceived as a "nuisance" by nearby residents. A major source of noise impacts from rail projects are the locomotive horns at at-grade highway-rail crossings. Crossing mitigation measures, such as quiet zones which preclude the need for train horns and bells, can address this concern.

Vibration impacts are rarely anticipated for most rail projects. Vibration is usually only a consideration and a concern in densely populated, urban areas where the rail transit system is located near the curb of an existing street and there may be the presence of older or historic residential and commercial buildings.

9.5 Other Environmental Considerations

The implementation of any major infrastructure project has the potential for significant environmental impacts. Rail projects often have much less impact than other modal projects because they take advantage of existing corridors and the right of way requirements are generally less than those for comparable highway projects. But thorough analysis of potential environmental impacts must be undertaken before any rail project can be initiated and efforts must be made to minimize and mitigate those impacts. Additional environmental considerations for rail projects include:

- **Ecological Resources and Wetlands**. Rail projects may have an impact on water quality, wetlands and/or floodplains. Effects to ecological resources and wetlands are usually measured by using county or regional land use data to estimate the acres of agriculture, open space (grassland/shrubs), woodlands, wetlands, and open water within a certain distance of each rail corridor alignment.
- **Historic and Cultural Resources.** Federal guidelines regarding historic and cultural resources must be followed during the development of rail projects. The potential for cultural resources concerns is usually low, but a survey to determine the presence of cultural

resources is recommended during the preliminary engineering and environmental assessment phase for rail projects. Sometimes historic sites or buildings connected with railroad history, such as train depots, may be located next to the railroad right of way and may be either included in or eligible for inclusion in the National Register of Historic Places.

- **Hazardous Materials and Special Waste**. Along any rail corridor there are likely to be a number of industrial and commercial properties which either abut or are close to the railroad tracks. Industrial land uses commonly have the potential for surface or underground contamination, particularly at sites which were used for industry before current environmental regulations went into effect. Moreover, since contamination can migrate underground via groundwater, properties which are not adjacent to the railroad right of way, but are nearby, also need to be considered during literature reviews and site inspections.
- **Visual Resources.** Visual and aesthetic concerns for railroad projects include the potential effects on views and neighborhood or community character or setting. Compatibility with the surrounding urban environment is important as well as potential effects on pedestrian linkages and people-oriented spaces near the rail lines.
- **Construction Impacts**. Any infrastructure project will have short-term impacts while the project is under construction. These impacts can be both environmental (run off, damage to adjacent property) and operational (disruption to rail and road traffic). Any rail construction project must incorporate plans to minimize and mitigate the impacts which are likely to occur during construction.

9.6 Summary of Environmental Considerations

For the majority of rail transit, freight and passenger rail projects, there are usually no environmental issues which would preclude the project from moving forward. The rail service for the state of Missouri provides significant benefits and an additional viable transportation option to move people and goods throughout Missouri and beyond. In general, freight and passenger rail service provides environmental benefits in terms of reduction in vehicle miles of travel and related benefits such as reduced fuel consumption, air quality improvements and enhanced mobility opportunities. For most rail projects, a streamlined environmental review and clearance process would be required during the project development phase which would include early preliminary engineering and an environmental assessment. This process under the auspices of NEPA would address all of the environmental issues adequately, ensure coordination with the resource and regulatory agencies occurs, and ensure communities and stakeholders are included in the project decision making. MoDOT, through its environmental stewardship, has the opportunity to promote energy and land use efficient transportation choices through new, expanded or enhanced state rail service.

9.7 Regional Balance

The development of railroad lines in Missouri has historically been related to two separate factors. Missouri's central location has made it a strategic focal point in the development of east - west and north - south transcontinental rail lines. Kansas City and St. Louis have developed over time as major hubs connecting various segments of the long distance rail network. Local rail connections within Missouri have been developed over time to provide

connections between these major routes and population centers and key shipping points. As a result of these historical development trends, Missouri has an extensive network of rail lines which provide services to all regions of the state. While abandonments have diminished the amount of rail service to certain areas of the state, most of the major abandonments involved rail lines which served similar long distance markets. For example, the largest railroad abandonment in Missouri over the past 40 years involved the Missouri, Kansas and Texas Railroad ("Katy") line between Sedalia and Machens, near St. Louis. This 200-mile-long line paralleled the UP route along the Missouri River, but was built closer to the river and much more prone to flooding. While many small communities directly on the Katy line were impacted by this abandonment in 1987, rail service through the center of the state continued on the UP line.

Short line railroads have served an important role in preserving rail service in parts of the state which otherwise might have been lost as a result of railroad mergers and abandonments. The MNA in southwest Missouri was created after the merger of the Katy and UP railroads and continues to provide service on lines which would have otherwise been abandoned.

Currently passenger service in Missouri is limited. The Missouri River Runner provides service between St. Louis and Kansas City through the central part of the state. This route serves several key communities along the corridor, including Jefferson City, the state capital. With the exception of two additional stops on long distance trains at Poplar Bluff in southeast Missouri (Texas Eagle) and La Plata in northeast Missouri (Southwest Chief), the rest of the state has no passenger rail service. Major population centers in the state including Springfield, Columbia and St. Joseph have no direct passenger services. The limited extent of passenger service in the state has led to a sense of disparity which becomes very evident each year when MoDOT seeks legislative approval for funding to support the operations of the Missouri River Runner. While support for this service is strong across the middle of the state, representatives from other regions see little direct benefit from this service and so are therefore reluctant to support providing funds for the operating costs.

One of the key focuses of the recommendations included in this state rail plan is to support the extension to other regions of Missouri. The plan recommends the addition of service to Springfield (from both St. Louis and Kansas City) and to Hannibal via Chicago and Quincy. The plan also recommends the implementation of feeder bus service to provide direct connections between the passenger rail lines and the cities of Branson, Columbia and St. Joseph.

10.0 Recommendations

The Missouri State Rail Plan recommends adopting the following strategies and policy recommendations to encourage the preservation and enhancement of passenger and freight rail facilities and services in the state:

10.1 Strategies for Passenger and Freight Rail Policy Development

To provide a framework for passenger and freight rail policy development, the Missouri State Rail Plan proposes the following strategies:

10.1.1 Establish a Multi-Year Strategy for Enhancing Passenger Rail Service in Missouri

1. Support the existing 79 mph Missouri River Runner service.
    a. Continue to develop public understanding and support for passenger rail
    b. Stabilize state operating support
    c. Strategically market the existing service
    d. Complete identified infrastructure improvements designed to improve the reliability of existing service
    e. Add modern operating equipment with amenities and features to attract new riders
2. Add additional frequencies to the Missouri River Runner service.
3. Develop a staged approach to implementing high speed passenger rail service between St. Louis and Kansas City.
    a. Position Missouri to leverage maximum amounts of future federal funding which may become available
    b. Pursue federal funding for NEPA and planning funds to address:
        i. Six or more round trips
        ii. Travel time less than four hours
        iii. Evaluate and identify a dedicated corridor route as appropriate
        iv. Initial operations 90 to 125 mph
        v. Evaluate alignment geometry to support long-term electrification and speeds over 180 mph
    c. Begin official mapping and purchase of right of way
    d. Identify state and local funding sources to match federal funding for passenger rail planning, engineering and construction
    e. Identify private sector funding opportunities
4. Conduct feasibility studies of other corridors to set priorities for future corridor development activities as appropriate.

10.1.2 Develop a Freight Rail Strategy Which Maximizes the Benefits of Freight Rail to State and Community Economic Development

1. Initiate programs and policies which are a part of an overall state economic development strategy and coordinated with the Missouri Department of Economic Development.
2. Facilitate additional use of existing team tracks, industrial spurs and sidings.
3. Support the development of additional rail access as appropriate to support new industrial development opportunities.

4. Identify mechanisms to encourage intermodal access at Missouri ports through the provision of additional rail access and trans-loading facilities.

10.2 Proposed Policies for Passenger and Freight Rail Development in Missouri

10.2.1 Seek Supplemental Federal Funding to Provide Financial Stability for the Missouri River Runner Service

Missouri does not have a dedicated state funding source to provide operating support for the Missouri River Runner service, which has ranged from $6.6 million to $8.1 million annually over the past five years. This has resulted in a public policy environment where the challenge each year in the state appropriations process is to simply maintain existing service rather than making investments to make the service more reliable and competitive with other modes.

Other states have used both CMAQ and FHWA Traffic Mitigation Funding to provide federal operating cost sharing support. For example, from 1998 to 2007 Wisconsin used CMAQ funds (80 percent) to support the Hiawatha service between Milwaukee and Chicago. Eligibility was driven by the fact both the Milwaukee and Chicago Metropolitan Areas are air quality standard non-attainment areas. The CMAQ funding ended in 2007 as CMAQ regulations were issued limiting operating support funding to three years. In 2008, the state of Wisconsin began using FHWA Traffic Mitigation funds tied to a series of federally-funded highway projects in the Milwaukee-Chicago corridor. The federal cost share has varied from 80 percent to 90 percent depending on whether the project was on a state route or interstate highway. Currently, FHWA Traffic Mitigation funding is tied to a multi-year improvement program on the I-94 North-South Freeway between Milwaukee and Chicago and provides 90 percent funding for Wisconsin's share of Hiawatha operating costs.

Missouri could consider these and other federal sources to provide supplemental state funding to support the Missouri River Runner service. In 2011, state support for the Missouri River Runner was $8.1 million. Federal funding from these programs could have reduced this state funding to between $810,000 and $1,620,000, depending on whether the cost share was 90 percent or 80 percent. This would potentially allow the use of the remaining funds for capital investments to increase service levels and reliability and potentially increase ridership and revenues and decrease subsidy requirements.

10.2.2 Seek Federal Funding for Tier 1 NEPA and Service Development Planning Work to Enhance Passenger Rail Service in the St. Louis to Kansas City Corridor

The major passenger rail priority for the Missouri State Rail Plan is to enhance passenger rail service on the St. Louis to Kansas City Corridor. However, NEPA documentation must be completed for an intercity passenger rail corridor project to be eligible or "funding ready" for the federal project development pipeline. The FRA High Speed and Intercity Passenger Rail Program is structured to require any project receiving a multi-year Service Program Development grant agreement to have completed a Tier 1 NEPA alternatives analysis and service development plan document. Thus, it's critical for this work to be completed for Missouri to successfully compete for highly competitive federal funding for projects to increase speeds, reduce travel times and increase frequencies on the St. Louis to Kansas City corridor.

The Tier 1 NEPA and service development planning work can be structured to examine route alternatives, evaluate shared-use versus dedicated corridor operations, and compare equipment technology options, as well as generate refined and up-to-date ridership and revenue forecasts. Based on similar projects in other corridors, the cost for such a study could run from $8 million to $10 million with a 20 percent state share of $1.6 million to $2.0 million.

10.2.3 Consider Initiating a Targeted Marketing and Advertising Program for the Missouri River Runner Service

A targeted advertising program can be a cost-effective means of increasing ridership and revenues and ultimately decreasing state subsidy payments required for the Missouri River Runner service. Many in Missouri do not regularly use the passenger rail service and are unfamiliar with the benefits and advantages of the Missouri River Runner. In the current environment, where many travelers will be looking for alternatives to the automobile in response to expected increases in fuel costs, a corridor-specific advertising campaign will have the potential to be particularly effective in increasing ridership.

Amtrak currently conducts a variety of advertising and marketing activities in Missouri and nationally. Advertising is conducted in print, electronic and web-based media in Missouri and neighbor state markets in conjunction with Amtrak's national advertising and brand awareness program. Amtrak advertising and media buys in Missouri markets are a part of a national program and focus on increasing awareness of the Amtrak brand. With national advertising budget constraints, Amtrak is limited in the amount of corridor and route specific advertising it can do in Missouri. Currently, Amtrak has a budget of approximately $28,000 for marketing activities in support of the Missouri River Runner service.

Federal CMAQ funds could potentially be used to support a targeted advertising program for the Missouri River Runner service with a budget of $125,000 annually for a five year period. The program could be targeted to reduce congestion and emissions on the Interstate 70 highway corridor parallel to the Missouri River Runner route. MoDOT also could work with Amtrak, the Missouri Division of Tourism and local convention and visitor bureaus to leverage their advertising dollars through co-op advertising campaigns.

A local advertising agency would be contracted to develop radio, print and web-based media content aimed at travel markets in St. Louis, Kansas City, Jefferson City and other station locations. The ad program would be designed to brand and increase awareness of the Missouri River Runner service with a goal of increasing ridership and revenues by an amount incrementally larger than the cost of the campaign. Key messages could be developed around the cost effectiveness of rail transportation in light of rising fuel costs and the service's improved on-time performance, as well as the benefits of new "next generation" passenger rail equipment when it becomes available on the corridor. Print media materials developed for the campaign also can be used to develop brochures, display boards, and billboards, etc. for use at local marketing events such a local fairs and festivals or specialized marketing activities, such as display ads at gas stations and airports.

10.2.4 Organize St. Louis to Kansas City Corridor Coalition

MoDOT currently staffs the Missouri Rail Passenger Advisory Commission (MORPAC) made up of rail advocates, local officials and other stakeholders. MORPAC provides a statewide sounding board for agency intercity passenger rail planning and service development activities. Other states such as Illinois also have organized passenger rail corridor coalitions to provide an opportunity for stakeholders in and along a corridor to become more involved in corridor-specific planning and advocacy activities. MORPAC could support the establishment of a St. Louis to Kansas City Corridor Coalition with representatives from each of the communities along the corridor.

In today's budgetary environment, state appropriations to match and leverage federal implementation funding will be challenging to obtain. To be successful, it will be important to develop private sector leadership in the corridor coalition. Strong representation from local chambers of commerce, business leaders and local economic development groups will be key to effective advocacy for state funding necessary to enhance passenger rail service on the St. Louis to Kansas City corridor.

10.2.5 Consider a State Bonding Program to Support Missouri Passenger Rail Development

PRIIA establishes the basic framework for federal intercity passenger rail funding. The act calls for an 80 percent federal, 20 percent state funding partnership, much like the current federal highway program. This allows for a limited amount of state funding to potentially leveraging substantial amounts of federal funding. However, this federal funding is discretionary and very competitive. Federal grant requirements under the HSIPR program give priority to grant requests which identify specific and dedicated state funding sources for the 20 percent match. This is a requirement even for early stage planning, engineering and environmental work.

Many states such as California, Minnesota, Illinois and Wisconsin have authorized general obligation bond funds which can be used on demand as a dedicated state funding source to match and leverage federal funding for intercity passenger rail projects. These programs have authorizing language supporting a variety of passenger rail project development activities including: corridor and project level NEPA documentation and alternatives analysis, preliminary engineering and final design, infrastructure and facility construction, and equipment procurement. Strategically, these states have used state funds to complete relatively low-cost, but time-consuming, NEPA work required to receive a commitment for multi-year federal Corridor Service Development Program funding. This is a required step to make the corridor eligible for future federal funding for construction and service initiation.

A bond authorization has the advantage of having no budgetary impact until bonds are actually issued, which in most cases requires additional action by the governor or the state legislature. A state can cite the availability of a state bond authorization as a dedicated source of match funding in federal HSIPR grant applications. Bonds are not actually issued until the federal grant is awarded and a cooperative grant agreement is executed.

Bond funding has many advantages for costly multi-year transportation projects by spreading out the budgetary impact over a large number of years. Current market rates for tax exempt

state bonds are at record lows which makes them extremely attractive for passenger rail projects at this time. Nationally, many 20-year state tax exempt bonds are being issued at rates below 2 percent.

A Missouri state bond authorization for intercity passenger rail development could be requested in stages. An initial authorization $10 million to $15 million could be requested to provide adequate funding to match expected Tier 1 and Tier 2 NEPA service development and preliminary engineering needs, as well as to fund small implementation projects needed to fill "gaps" in federal funding. Future authorization requests could be structured to support federal match requirements for final design, land acquisition, equipment procurement and infrastructure construction as federal funding becomes available.

10.2.6 Consider Expanding the State Transportation Assistance Revolving Fund (STAR)

The State Transportation Assistance Revolving Fund (STAR) can provide loans on favorable terms for the planning, acquisition, development and construction of passenger and freight rail facilities and the purchase of rolling stock for transit purposes. The STAR Fund typically provides between $500,000 and $1 million in loan funds each year. The program has assisted in financing a multimodal facility in St. Louis to bring together passenger rail, MetroLink and public transit modes. However, since its inception, this program has been primarily used to help local public airports finance improvements not eligible for federal or state grant programs.

Missouri should consider expanding the size of the program to allow it to support additional passenger and freight rail projects. State loans on favorable terms could support public-private partnerships for multi-use commercial developments at passenger stations. The program could also be used as a part of an overall economic development funding package for local communities to provide additional rail access for industrial and commercial development projects, as well as support additional short line service to underserved communities. Because loan payments revolve back into the fund, a one-time-only capitalization of at least $5 million could provide a long-term funding stream for passenger and freight rail projects.

10.2.7 Consider Developing a State Freight Rail Economic Development Grant Program

Missouri could consider establishing a state grant program to support freight rail investments made as a part of the overall state economic development program. While Missouri does not have a funding program for freight rail projects, all 14 other states surveyed as a part of the Missouri State Rail Plan provide state funding for freight rail improvements. Targeted investments in freight rail facilities can have significant economic development benefits when coordinated with an overall state economic development strategy and program.

Many states have freight rail grant and loan programs designed to provide support for industrial development activities. Examples include: the Virginia Rail Industrial Access Program, the Indiana Industrial Rail Service Fund, the Wisconsin Transportation Economic Assistance Program and the Iowa Railroad Revolving Loan and Grant Program.

Several states have freight rail programs which are designed to provide capital funding for the preservation, rehabilitation and maintenance of short line railroads. These programs are based on the understanding short lines provide freight transportation critical to the businesses and industries they serve. Examples include: the Virginia Shortline Railway Preservation and

Development Fund, the Wisconsin Freight Rail Preservation Program, North Carolina Short Line Infrastructure Assistance Program, the Illinois Rail Freight Program, the Pennsylvania Rail Freight Assistance Program, and the Kansas State Rail Service Improvement Fund.

A Missouri Rail Enhancement (MORE) program could provide grants to local communities, local economic development authorities or other non-profits to provide rail infrastructure needed for specific economic development projects. Grant funds could be provided for the expansion and installation of team tracks, industrial spurs and sidings, trans-loading facilities, port access improvements and short line track improvements as needed to support state economic development projects identified by the Missouri Department of Economic Development or local economic development agencies. These grants would provide from 50 percent to 100 percent of the project costs, dependent on the economic development benefits provided by the funded project. Based on a review of other state freight rail programs, an annual funding level of $5 million could provide substantial economic development benefits.

10.2.8 Consider Expanding the MoDOT Port Capital Improvement Program

The Port Capital Improvement Program is administered by MoDOT provides capital grants to Missouri ports to improve intermodal rail access under Section 68.035 of the Missouri Revised Statutes. In the last 10 years, the program has only received state funding in four years: $500,000 in 2006, $1.5 million in 2007, and $6.65 million in 2009 (plus an additional $4.5 million federal ARRA funds). This program is oversubscribed generally and unfunded applications have been received for $52.2 million in freight rail access projects, including loop tracks, rail bridge improvements, track improvements and rail access extensions. Consideration could be given to expanding this program to fund additional rail access and improvement projects.

10.2.9 MoDOT Railroad Section Organization and Staffing Recommendations

MoDOT should consider the organizational and staffing implications of the renewed interest in intercity passenger rail development at the national level based on an active federal-state partnership and an increasing emphasis on project implementation and project management activities. The focus and the majority of the staff in the MoDOT Railroad Section are devoted to freight rail regulation, track inspection and grade crossing safety activities. Currently less than one full time equivalent staff person is available to support rapidly growing intercity passenger rail support activities. These activities include: coordination with Amtrak and managing the Amtrak service contracts (approximately $8 million annually), host railroad coordination, public information and involvement, passenger rail planning, applying for and managing federal HSIPR grants, and managing project construction. In the five years from 2007-2011, the MoDOT Railroad Section successfully applied for, and is managing, at least 20 federal planning, construction and equipment grants totaling $179 million, with total project costs of approximately $242 million. This includes Missouri's estimated $125 million share of a $268 million grant for Next Generation passenger equipment.

Other states have added passenger rail units to their organizational structure and have increased staffing levels for this function – either through reassigning existing staff or hiring consultants to perform as extensions of state staff – often on premises. Missouri DOT could consider conducting a staffing and organizational analysis of the current and expected workload

in the Railroad Section in light of the evolving state and national emphasis on intercity passenger rail project implementation.

10.2.10 Develop a Rail Asset Management Program

Transportation Asset Management (TAM) involves integrating management or business practices across organizations like MoDOT into a coherent system. While asset management is crucial to meet the future transportation demands and growth, it cannot be generalized ("one size fits all"), as the path to economic growth varies widely from one organization to another.

MoDOT should develop a Transportation Asset Management Plan to formalize the process on managing the state's rail assets. The plan should focus on analysis, alternate process development, programs, delivery mechanisms, and reporting mechanisms to ensure a successful strategic objectives implementation. Information about assets, their management strategies, long-term expenditure forecasts, and business management processes are inherent to the asset management plan. The plan should formalize and document key information including:

- The strategic outcomes or objectives it supports
- The investments in assets MoDOT has made now and in the future and the intended purpose of those investments
- The nature of the assets required to deliver rail services and their current condition and performance in a form relevant to assessing the achievement of the agency mission
- Planned asset improvements and capacity expansion in response to future demand, risk, and other trends
- Description of how the assets will be cost-effectively managed throughout their life cycles
- Long-term financial forecasts to inform program development and budget cycles
- Planned improvements in asset management business processes, goals and requirements for resource availability and productivity, and desired future performance resulting from implementation of the plan

The TAM Plan should be integrated with the MoDOT Tracker to provide performance measures to track the status of rail transportation assets and the benefits that result from Missouri's investments in those assets.

10.2.11 Summary of Proposed Future Missouri Rail Projects and Programs

In summary, **Table 23** below lists the projects and programs that are recommended for implementation over the next 20 years in the Missouri State Rail Plan. These projects will continue state support for the Missouri River Runner service, complete capital projects to enhance that service, advance the implementation of high speed and intercity service and provide new freight programs to support economic development.

Table 23: Proposed 20-Year Program: Missouri Rail Projects and Programs

Project Name/ Description		Cost Over 20-years (2012 $)	Notes
Projects Enhancing Current Missouri River Runner Service			
New Locomotives (3)	Equipment	$25,000,000	For new train sets 2011 ARRA
Bonnot's Mill Crossover	FD/Construction	$6,300,000	PE/NEPA funded 2009 ARRA
Knob Noster Siding	FD/Construction	$9,900,000	PE/NEPA funded 2009 ARRA
Hermann Crossover	FD/Construction	$5,000,000	PE/NEPA funded 2009 ARRA
Jefferson City Third Main Track	FD/Construction	$10,800,000	
Kingsville Passing Siding	FD/Construction	$11,550,000	PE/NEPA funded 2009 ARRA
Strasburg Grade Separation	FD/Construction	$10,000,000	PE/NEPA funded 2009 ARRA
Lee's Summit to Pleasant Hill Double Track	FD/Construction	$48,400,000	PE/NEPA funded 2009 ARRA
Independence Street Bridge Replacement	FD/Construction	$23,700,000	
New Track North Market St. to Biddle St.	FD/Construction	$6,000,000	
New Jefferson City Station	FD/Construction	$11,000,000	
New Mississippi River Crossing	FD/Construction	$150,000,000	Approach funded 2011 ARRA
New Passenger Communication System	FD/Construction	$3,000,000	
Pleasant Hill to Jefferson City Double Track	PE/NEPA	$10,000,000	
Subtotal		**$330,650,000**	
Ongoing Support for Existing Passenger Service			
Operating Support for River Runner	Operating	$176,400,000	$8.82M/year (FY12-16 STIP)
Station Improvements	Stations	$500,000	$25,000/year (FY12-16 STIP)
Amtrak Advertising	Marketing	$2,500,000	$125,000/year (FY12-16 STIP)
Subtotal		**$179,400,000**	
Planning for Future High Speed Rail Service			
HSR Corridor Planning KC-STL	PE/NEPA	$10,000,000	(FY12-16 STIP)
Intercity Rail Planning - Other Corridors	PE/NEPA	$10,000,000	Springfield, St. Joseph, Hannibal
New KC-STL 110mph+ Dedicated Corridor	Right of Way	$600,000,000	TBD by HSR PE/NEPA study
Subtotal		**$620,000,000**	
Existing Grade Crossing Safety Program			
State Grade Crossing Program	Safety	$18,174,000	$908,700/year (FY12-16 STIP)
Federal Grade Crossing Program	Safety	$119,600,000	$5.98M/year (FY12-16 STIP)
Subtotal		**$137,774,000**	
Proposed Freight Funding Programs			
Expanded STAR Loan Program	Loans	$5,000,000	One time capitalization
New MORE Freight Grant Program	Grants	$100,000,000	$5M/year; 50% - 100% match
Subtotal		**$105,000,000**	
TOTALS		**$1,372,824,000**	